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"ARCHITECTURE" AND "THE BRITISH ARCHITECT"

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1851 – 1951

THE task of Devil's advocate is never a grateful one, and a recital of the difficulties facing those who hope to mark the centenary of the 1851 International Exhibition by another worthy of the present age and developments, while a necessary duty, is not altogether without discouraging elements. The Government has regarded the question as worthy of especial attention, and in appointing a Board of Trade Committee under the Chairmanship of Lord Ramsden* has included in its terms of reference the possibility of an International Exhibition in the immediate future.

With the general recommendations of this Committee on the regulation of the scope and frequency of International Trade Fairs we are less concerned than with those dealing with the desirability of holding the next one in London, preferably in the year 1951, and with the suggestions made as to the sites available for such an undertaking. As a basic definition of what would be contemplated, we can but quote a few sentences from the report, as follows: "A Universal International Exhibition should be held in London at the earliest practicable date to demonstrate to the world the recovery of the United Kingdom from the effects of the war"—"such an exhibition could be a great demonstration of international progress." If the date 1951—"is not practicable," it "should not be long delayed after that"—"It should surpass the New York World's Fair of 1939 in scale and technical achievement, and the Paris Exhibition of 1937 in æsthetic excellence and personal appeal."

Central London is regarded as the only appropriate position and only two sites there are found possible, Hyde Park and the south bank of the Thames. The first consideration therefore must be a comparison between these two. In speed of development and the cost of erecting suitable buildings Hyde Park has obvious advantages and could offer over 100 acres without entailing any subsequent disfigurement. On the other hand, the public would lose the use of this area for some five years or more, and there would be but little resulting gain to the amenities of our capital city, so urgently in need of these. The claims of the south bank of the Thames rank very high in respect of this last aspect, as it is already earmarked for redevelopment, and an exhibition could be laid out to form a suitable prelude to this. It could, however, offer only about half the area available in Hyde Park and the cost of the initial compensation and the extensive works in reclamation, etc., would be relatively enormous. The result would be a permanent asset, but in view of the numerous urgent demands on materials and labour in other directions at the present time, it is very doubtful if the requirements of such a scheme could be met within a reasonable period.

If these difficulties could be overcome the adoption of the river bank site would be an important step in forwarding the "London Plan" including the underground transport route between Westminster and the City together with two or three temporary or even permanent covered footbridges from the Victoria Embankment across the river; moreover, many of the buildings might be designed to remain as part of the development visualised for this river frontage. Nevertheless, despite the strong feeling that this is the best site, it is doubtful whether present conditions will make its adoption practicable, and with the almost equal aversion from the use of Hyde Park the question of a suitable site remains unsolved.

Suggestions for some other site in or near the central area would deserve consideration, but nothing strikes the eye. It is doubtful if what is left of Holland Park would be adequate, and Parliament Hill Fields is not very accessible, while the clearance of any large area of obsolescent buildings would present similar difficulties to those of the Thames side; thus the only alternative seems to be that of going farther afield—an alternative that is definitely discouraged in the Committee's report; nor is it in favour of substituting a British Empire Exhibition, feeling that this would make demands of a type very similar to an International one. It may be that the experience at Wembley discourages the adoption of a suburban site, but it must be remembered that in that case an undue proportion of substantial building was employed where more temporary structures would have served their purpose. Conditions are not quite the same in the case of the Crystal Palace at Sydenham, which it is definitely intended shall be reconstructed and which would be admirably suited to form the nucleus of an exhibition. If such a solution were adopted it would clearly be necessary to include in the building programme a well-devised scheme for rapid access by road and rail as well as local developments in the form of hotels and hostels, most of which additions would have a permanent value to the public during various sports and other meetings for which this would become the obvious centre. The conditions of the architectural competition, which is now under adjudication, set forth very specifically this intention, and its result can hardly fail to indicate a scheme suitable to become the basis of a typical exhibition group.

The general opinion that an International Exhibition should be held, if possible in 1951, has been clearly and emphatically expressed, but the views as to where it can best be placed are widely divergent, as may be seen in communications to the daily Press, and even these do not touch the technical aspects of the problem. It may be regarded as our own function to examine such aspects, and, in justification of this attitude, to point out that it is essential to recognise the probable complications and difficulties beforehand, as a warning against forming decisions that might prove incapable of attainment. There is but little time to spare, and the only hope of success would be the adoption of a clear and well-detailed programme at as early a date as possible.

* Exhibitions and Fairs. Board of Trade. Report of Committee, March, 1946. H.M. Stationery Office. Price 3d.

NOTES AND NEWS

R.I.B.A. Annual Meeting.

THE 108th annual general meeting of the R.I.B.A. will be held on Tuesday, May 7, at 6 p.m., to receive the annual report of the council and committees for the official year 1945-46, to nominate candidates (two members) for the office of hon. auditor for the ensuing year, and to receive the list of attendances at the council during the session.

Town Planning Examination Results.

THE first of the Three Months' Completion Courses in town and country planning open to men and women from the Forces who had reached a required standard in the War Office Correspondence Course, ended on March 30. Success in the examinations entitles the candidates to professional membership of the Town Planning Institute subject to a period of practical experience and certain professional qualifications.

The School of Planning and Research for Regional Development, under whose auspices the examinations are held, announce that the first six successful candidates were (in alphabetical order) :—T. A. L. Bolton, A.R.I.B.A., London; K. R. Fennell, P.A.S.I., Orpington; L. N. Fraser, A.M.I.C.E., Southport; W. H. Mundy, A.R.I.B.A., Farnham; E. G. Sambrook, Walsall; R. V. Ward, A.R.I.B.A., London.

Other successful candidates were : G. E. Carter, A.R.I.B.A., London; M. A. Carter, P.A.S.I., Ipswich; T. A. L. Concannon, F.R.I.B.A., Hongkong; E. J. L. Griffith, P.A.S.I., Bristol; S. C. Lock, A.R.I.B.A., Huntingdon; R. C. McKenzie, P.A.S.I., East Croydon; R. C. Tice, P.A.S.I., Letchworth; T. E. Vulliamy, B. Arch., M.A., Cambridge; A. Wilson, Carshalton; and J. D. Wood, A.R.I.B.A., London.

The Roosevelt Memorial.

THE recommendation has been made by the Franklin Roosevelt Memorial Committee that Grosvenor-square is the most suitable site for the proposed monument to President Roosevelt. It was stated at a recent meeting of the committee that the Government had been informed of the recommendation and that the Government had agreed to take over Grosvenor-square garden and statue in perpetuity should the square be obtained. The proposed site had the wholehearted support of the American Ambassador. The sculptor will be Sir William Reid Dick, R.A., and the architect Mr. B. W. L. Gallannaugh, F.R.I.B.A.

Brazilian Institute of Architects.

MR. S. H. LOWETH, F.S.A., F.R.I.B.A., Kent County Architect, has been elected an Honorary Corresponding Member of the Brazilian Institute of Architects.

Lectures on "Professional Practice."

A COURSE of twelve lectures on "Professional Practice" will be given by Mr. W. T. Creswell, K.C., Hon.A.R.I.B.A., Hon.M.Inst.Arbitrators, etc., on Tuesday afternoons, beginning on April 30, in the Bartlett School of Architecture and Town Planning, at University College.

Deputy City Architect, Liverpool.

LIVERPOOL City Council invite applications from registered architects who are members of the R.I.B.A. for the position of Deputy City Architect and Director of Housing. Salary £1,500 per annum; age limit 40. Details are advertised in this issue.

Dewsbury County Borough Architect.

APPLICATIONS are invited by Dewsbury Borough Council for the appointment of Borough Architect and Buildings Surveyor. Applicants must be members of the R.I.B.A. Salary £900 per annum, rising to £1,100, exclusive of cost-of-living bonus. Details are advertised elsewhere in this issue.

Professional Announcements.

MESSRS. LANCHESTER & LODGE, of 10, Woburn-square, London, W.C.1, have taken into partnership the following four senior members of their staff : A. Johnson, F.R.I.B.A., N. S. Morris, A.R.I.B.A., O'B. J. L. Rowe, and A. Writer, A.R.I.B.A. They have been with the firm for many years, and the practice will continue on exactly the same lines as in the past.

MR. EDWIN T. WRAIGHT, P.A.S.I., M.R.S.I., chartered quantity surveyor, announces that the practice formerly carried on at 2, Queen's-drive, Bristol, 7, will be conducted in future from 18, Orchard-street, Bristol, 1. (Telephone No. : 24638.)

MR. WALTER B. BOND, F.S.I., M.Inst.B.E., of Birmingham, has reopened his Cornish office at 62, Lemon-street, Truro, and would be glad to receive trade catalogues.

From *The Builder* of 1846

Saturday, April 25, 1846.

ST. MARY REDCLIFFE. The present meeting, the most gratifying at which he had ever been present, was a triumphant reply to the assertion that men in Bristol were too actively engaged in making fortunes to attend to matters of literature or regard the works of antiquity. The erection of that building, however, was itself sufficient to refute the calumny, and the present citizens were anxious to emulate its founder. . . . He would ask them for three honest, hearty British cheers for the restoration committee, who had worked so well.

*** The speaker was George Godwin, and the occasion the laying of a stone on the last buttress on the north side of the chancel, to commemorate the restoration and the projected spire of which he was the architect. The cheers, we are told, "were taken up by the multitude and prolonged for several minutes."

COMING EVENTS

Saturday, April 27.

FRIENDS OF THE CITY CHURCHES. Conducted tour of some City Churches. Mark-lane District Station. 2.30 p.m.

Monday, April 29.

L.M.B.A. (North-Eastern Area). Luncheon meeting at Chigwell. Speaker : Mr. G. H. A. Hughes, Director, L.M.B.A.

Tuesday, April 30.

INSTITUTE OF FUEL. Conference on "Industrial 'Waste Heat' Recovery." Geological Society's Rooms, Burlington House, W.1. 10 a.m.

L.M.B.A. (North-Western Area). Luncheon meeting. Speaker : Mr. E. W. Garrett, President, L.M.B.A.

COUNCIL FOR VISUAL EDUCATION. Annual General Meeting. The Housing Centre, Suffolk-street, S.W. 2.30 p.m.

ARCHITECTURAL ASSOCIATION. Mr. Henry Russell Hitchcock on "Acclimatisation of Modern Architecture in Different Countries." 36, Bedford-square, W.C.1. 6 p.m.

Wednesday, May 1.

IRON AND STEEL INSTITUTE. Annual Meeting. 4, Grosvenor Gardens, S.W.1. 9.45 a.m.

ARCHITECTS' BENEVOLENT SOCIETY. Annual General Meeting. 66, Portland-place, W.1. 3 p.m.

ARCHITECTURAL SCIENCE BOARD. Mr. Frank Scarlett on "Relationship of Air Photographs to Architecture and Town Planning." 66, Portland-place, W.1. 5.45 p.m.

Thursday, May 2.

TOWN AND COUNTRY PLANNING ASSOCIATION. Mr. H. Berry on "Town Planning and Water Supply." 28, King-street, W.C.2. 1.15 p.m. (buffet lunch, 12.45 p.m.).

Friday, May 3.

HOUSING CENTRE. Conference on Rural Housing. Speakers : Mr. Aneurin Bevan, Dr. W. B. Stott and J. Brian Cooper, F.R.I.B.A. 13, Suffolk-street, S.W.1. 10.30 a.m.-4.30 p.m.

Saturday, May 4.

INSTITUTION OF SANITARY ENGINEERS. Visit to Refuse Disposal Works, etc., Wembley. 10 a.m.

INSTITUTION OF MECHANICAL ENGINEERS. Mr. H. J. Weighall on "Surface Finish and its Relation to Production." Storey's-gate, S.W.1. 3.30 p.m.

From "John Nash," by John Summerson (Allen & Unwin).

THE REGENT'S PARK TERRACES. (See facing page.)

Cumberland Terrace.

THE REGENT'S PARK TERRACES

CONVERSION INTO GOVERNMENT OFFICES

As recorded in *The Builder* recently, there is no immediate intention of allowing the Regent's Park terraces to be demolished. These terraces, designed for George IV, are among the finest remaining relics of Regency London, and represent the art of John Nash, architect to H.M. Office of Woods and Forests. Two hundred and twelve large houses in these terraces, built between 1821 and 1826, are to be converted for temporary use as Government offices, and this conversion will in no way mar their architecture.

Nor will this decision to establish a satellite Whitehall prejudice the eagerly-awaited report of the Regent's Park Terraces Committee, which was established by the Prime Minister " to consider the future of the Terraces adjoining Regent's Park from all aspects—architectural, town planning and financial—and to make recommendations as to their future adaptation or replacement to meet modern requirements." The 212 houses have been taken over in all cases by agreement, either with the Commissioners of Crown Lands or with the lessees.

It is quite clear that the scheme will be of great value in preserving the houses from further deterioration and, at the same time, it will provide at about £1 a foot upwards of 500,000 square feet of office space which will enable the Minister of Works to release an equivalent amount of requisitioned accommodation.

The houses which are to be used for office accommodation are unsuitable for conversion into flats, owing to the very large expenditure of labour and materials that would be involved. Such conversion would, indeed, prejudice the future of the houses more than their use as temporary offices for the Government. The Ministry of Works has a fine reputation for jealously guarding buildings of architectural merit, and its recently appointed Director General of Works and Chief Architect may be relied upon to see that this reputation is not besmirched by the current scheme.

Many of the houses which the scheme covers have been empty for years; others were damaged by the war and fell into disrepair. Now, it may be said, there is every hope that they will be preserved as one of the most interesting period pieces of London architecture.

Early in 1944 shortage of office accommodation in London became so acute that the Ministry of Works made overtures to the Commissioners of Crown Lands for the use of the terraces. With the exception of some houses in certain terraces, which were reserved for residential use, all the houses at the disposal of the Commissioners were made available on a short-term arrangement. The Commissioners subsequently handed over 161 houses to the Ministry and a further 51 houses, which, though empty, were let on lease, were taken over by agreement with the lessees. The Ministry of Health gave their consent to the houses being converted from residential use, and in June, 1945, the scheme was approved by all concerned.

Before the repair and adaptation of the houses could start, however, the flying-bomb raids made it necessary to use all available operatives on first-aid repairs to bomb-damaged houses, and it was not until recently that the labour position allowed the letting of contracts for this work to be contemplated. Before preparations to start the work were put in hand a balance sheet was carefully drawn up to indicate whether the residential accommodation that could be provided by the labour and materials to be used would exceed the amount that would be made available by the release of requisitioned flats following the transfer of Government servants to the converted buildings. The result showed that there was every reason for putting the scheme into operation.

The work which is now to be carried out consists broadly of doing the minimum necessary to make the terraces fit for occupation and to prevent further deterioration. More than half of the total estimated cost of the work (about half a million pounds) is in respect of work which would have to be done to the terraces no matter what use was proposed for them. Indeed, a great deal of the work must be done in the near future to save the terraces from becoming virtually ruins. This work includes repairs to roofs, ceilings, windows, etc., and such renovation of stucco as is necessary.

The installation of central heating by low-pressure hot water and the reconditioning of lighting are both permanent improvements, the value of which is in no way tied up with use of the buildings as offices. The adaptations themselves include items such as boiler houses which are also permanent improvements. Apart from this work, communicating corridors running the length of each block and additional sanitary accommodation will be constructed. All this work has been reduced to the minimum and no unnecessary decoration will be carried out.

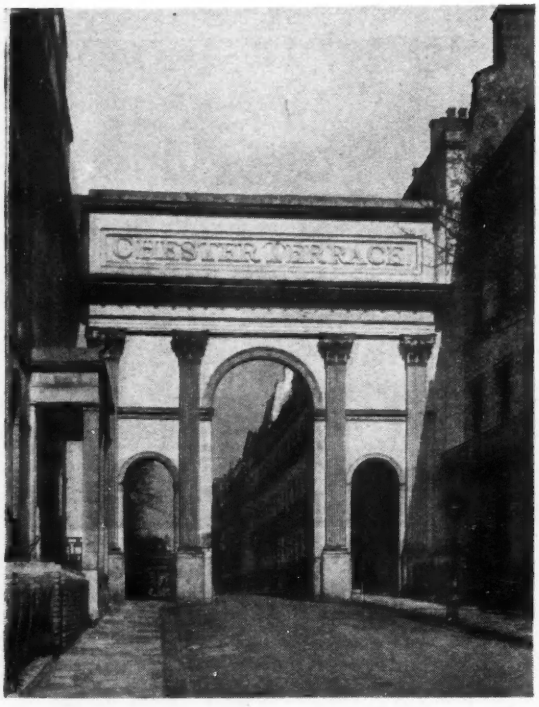
The work will be carried out in eleven separate contracts, the first four of which, covering 40 houses, have been let to Messrs. Holloways, Messrs. Carmichaels (2), and Messrs. Higgs and Hill.

This scheme, for which we have to thank the foresight of the Ministry of Works, is expected to be completed in 15 months and covers the following houses :—

Sussex Place : Numbers 2-10, 13, 14, 21, 23, 24, 26.
Clarence Terrace : Numbers 1, 3, 4, 6-11.
Cornwall Terrace : Numbers 2-21.
York Terrace : Numbers 1-18, 20-23, 25-29, 31-34, 36, 38-43, 51-53, 58-60, 30 (first floor only), 35 (first floor only).
York Gate : Numbers 1-3, 5, 8, 9, 11, 12.
Ulster Terrace : Numbers 1-3, 5-8.
Ulster Place : Numbers 18, 20, 26.
St. Andrew's Place : Numbers 1-3, 5-8.
Someries House.
Cambridge Gate : Numbers 1, 2, 6, 7.
Cambridge Terrace : Numbers 1-4, 7-10.
Chester Gate : Numbers 2-4.
Chester Terrace : Numbers 1, 2, 4-10, 12, 14-21, 23-26, 28-30, 32, 34, 36-42.
Chester Place : Numbers 1, 5, 7, 9, 10.
Cumberland Terrace : Numbers 1-4, 6, 8-11, 13-19, 21-26, 28-32.
Gloucester Gate : Numbers 2, 4, 9, 15,
Cumberland Place : Numbers 2, 4.
Prince Albert Road : Numbers 2-8, 11, 12.

Some Architectural Notes.

Nash, if not a meticulous designer, was an expert planner and thoroughly recognised the composite nature of the subject. His original scheme for the lay-



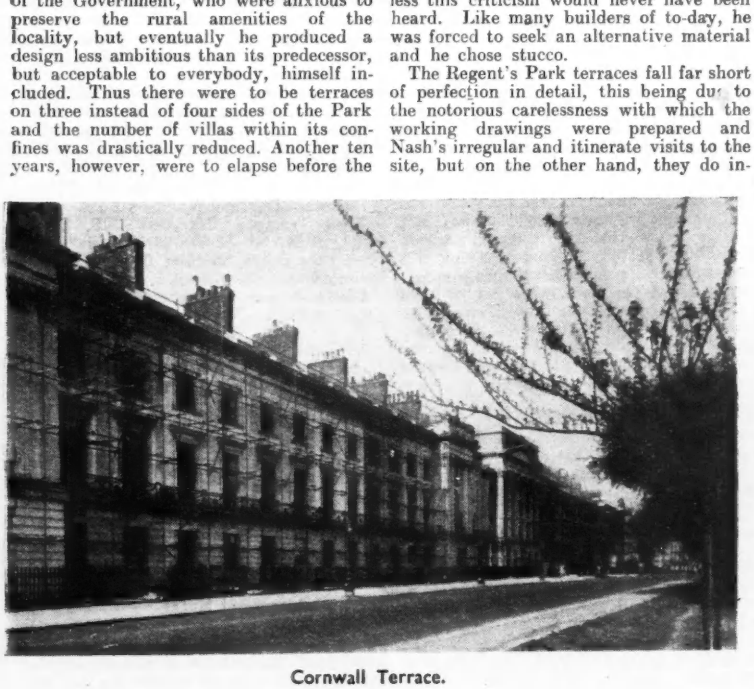
Chester Terrace.

out of the Park was far more comprehensive than that we know to-day; in fact, it was intended to be what has been described as "a garden city for the aristocracy," such a treatment being due, no doubt, to the influence of Humphrey Repton, a prominent landscape gardener of the day, who had formerly been Nash's professional partner during the years 1797 to 1802.

Nash's first plan, submitted in 1811, met with opposition, mainly from members of the Government, who were anxious to preserve the rural amenities of the locality, but eventually he produced a design less ambitious than its predecessor, but acceptable to everybody, himself included. Thus there were to be terraces on three instead of four sides of the Park and the number of villas within its confines was drastically reduced. Another ten years, however, were to elapse before the foundation of the first terrace to be built was laid. By this time Nash was fifty-nine years old and had been architect to the Prince Regent for nearly eight years.

He followed contemporary architects in adopting the new architectural fashion which combined Greek and Roman styles and built in stucco, with the result that the criticism of "superficiality" has often been levelled against his work; though had he used Bath stone, as he would have had it been available, doubtless this criticism would never have been heard. Like many builders of to-day, he was forced to seek an alternative material and he chose stucco.

The Regent's Park terraces fall far short of perfection in detail, this being due to the notorious carelessness with which the working drawings were prepared and Nash's irregular and itinerate visits to the site, but on the other hand, they do include glimpses of masterly "scenic" architecture, notably at Park Crescent, with its Ionic colonnades, and at York Gate, where Hardwick's parish church of St. Marylebone rises majestically in the vista. Also, they serve to illustrate how gracefully the transition from town to country can be accomplished.



Cornwall Terrace.

Cornwall Terrace, in the south-east corner of the park, was the first terrace to be built, and work was commenced on it in 1821 by James Burton. The design is typical of Nash and consists of 21 houses.

York Terrace is on the southern side of the park and falls mainly into two identical parts, separated by York Gate. A remarkable feature of this terrace is that all the houses therein are entered from the road at the rear. This arrangement clearly assists in preserving the impressiveness of the front façade facing across the park. York Gate lies between the two terrace-blocks with Marylebone Church to the south. The Ionic order of the gate is carried on by the terraces on either side to the east and west.

Sussex Place, built in the same year, is the only terrace around the park with curved wings; but the most striking features are the ten pointed domes surmounting the building.

The terrace as a whole was by no means kindly received by contemporary critics, one of whom wrote, "the whole has too much the air of an experiment in brick and mortar," while of the curved plan he commented, "it is not only a positive defect but absolutely productive of no beauty whatever in the elevation."

James Burton also built Chester Terrace, which was begun in 1825. Like Cumberland Terrace, its neighbour, Chester Terrace stands back from the road encircling the park, being separated therefrom by a strip of garden running the length of the terrace. At either end of the main block two houses stand forward from the rest, architectural connec-

York Terrace.

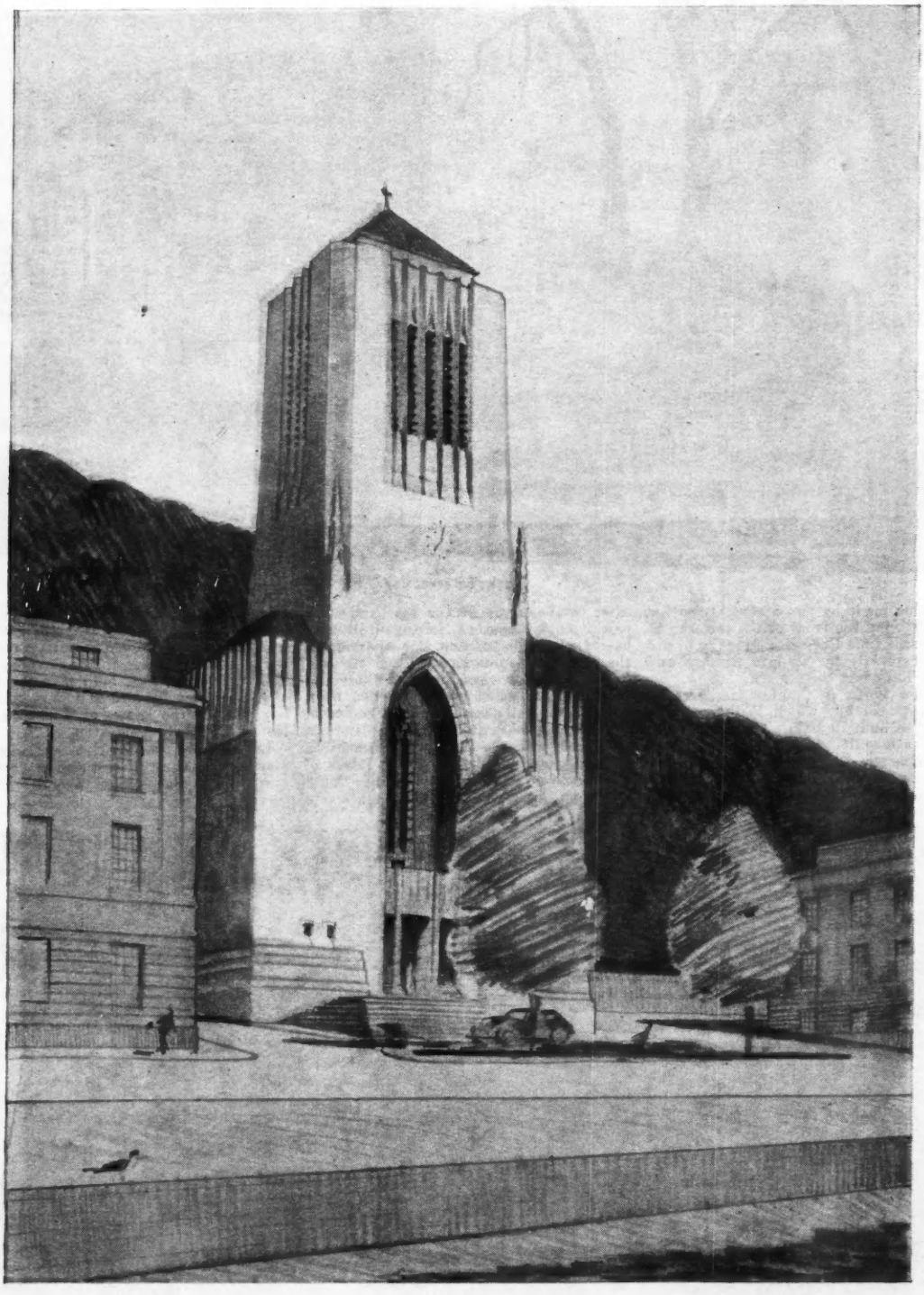
tion being made by two arches across the road servicing the front of the terrace. At the present time Chester Terrace is in sad need of repair, for air-raid damage and neglect have left their mark.

Farther north is Cumberland Terrace, the largest of all, which William Nurse started to built in 1826 This is Nash at his most magnificent. The large central block separates four other principal blocks, two on either side, and these again are separated by Ionic arches leading, in each case, to the mews in the rear and to a pair of smaller houses. Here again the war has wrought destruction, for apart from the obvious dilapidations to Nash's stucco façade, much damage has been caused to the interiors, which were designed by a young architect named James Thompson.

Some time back the Prime Minister set up a committee, under the chairmanship of Lord Gorell, to determine the future of the terraces. Marylebone Borough Council, which has given the subject much consideration, has made a submission to the committee which states that the Council feels, not without some regret, that it is not practicable to retain the terraces, and that redevelopment should take the form of multi-storey flats, with a proportion of hotels, and some houses of modern design for single-family occupation.

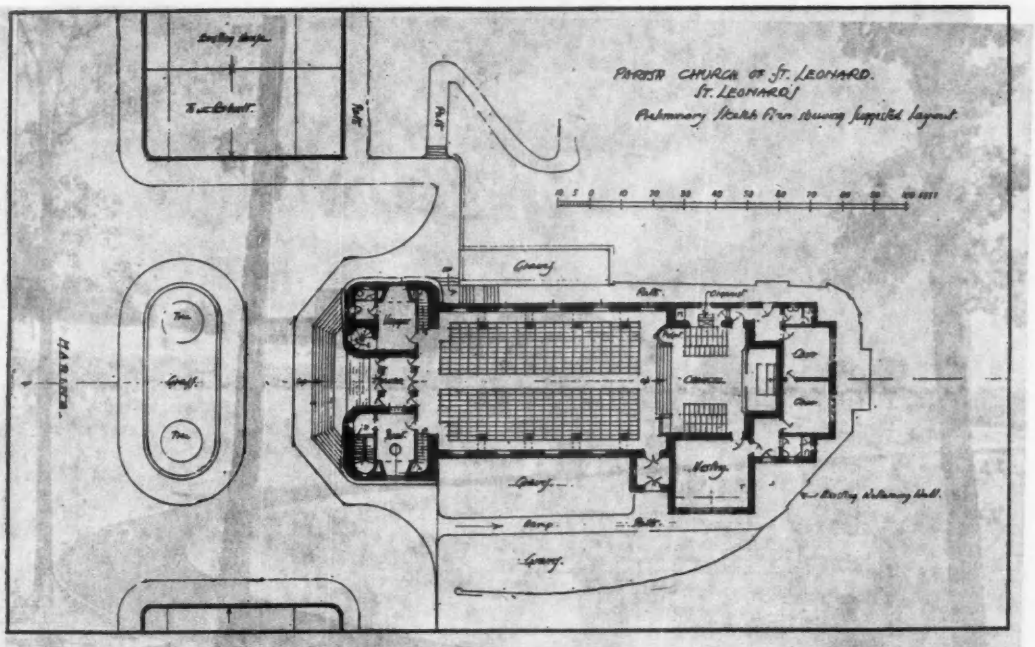
London has all too few examples of planned layout on so vast and magnificent a scale and the terraces should be preserved.

Sussex Terrace.



DESIGN FOR ST. LEONARDS PARISH CHURCH, SUSSEX

SIR GILES SCOTT, O.M., R.A., F.R.I.B.A., AND ADRIAN GILBERT SCOTT, F.R.I.B.A., ARCHITECTS



The Plan.

DESIGN FOR ST. LEONARDS PARISH CHURCH, SUSSEX

SIR GILES SCOTT, O.M., R.A., F.R.I.B.A., AND ADRIAN GILBERT SCOTT, F.R.I.B.A., ARCHITECTS

THE CHURCH EXISTING BEFORE THE ADVENT of a V1 bomb was built in 1834 by James Burton, the father of Decimus Burton, as part of his speculative project of founding St. Leonards as a fashionable offshoot of Hastings. Judging by the unfortunate architectural results, it is hard to believe the tradition that he was assisted by his son in producing such appalling examples of stucco Gothic villas in a speculative builder's dream of a Gothic Garden City. Decimus Burton, moreover, designed so many charming examples of stucco Greek buildings in the town, all so refined and cultured, as to prove that he can have had nothing to do with his father's schemes. These included the charming little porticoed house (in which Queen Victoria stayed) on the sea front only a few houses away from the Parish Church site.

The V1, which came in low through a narrow gap in the sea front before entering the west door of the church, demolished some five houses between the church and the sea front, thus opening up the site to the sea in a dramatic way—a definite town planning improvement, which the town-planning committee have recently recommended should be retained as indicated in the illustration.

The site is now a very fine one, open to the sea and backed by the precipitous wooded slope behind, while the view from the church through the west doorway will be quite unique as, owing to the steep slope in front, the waves appear to be running right up to the west doorway. The 1834 church, though faced in local stone, was a poor example of "Chapel" Gothic, tucked away behind the sea front houses and unworthy of the dignity of a parish church. James Burton was responsible for its building and design and—probably to give an air of respectability to his newly-created garden city—the foundation stone was laid by Her Royal Highness Princess Sophia Matilda of Gloucester on the coronation day of William IV, the double event being celebrated with a dinner, "including a roasted ox and other modes of rejoicing." Decimus Burton is buried beneath a miniature pyramid on the precipitous slope behind the church, in imminent danger of sliding down the hill on to the site. In fact, a serious landslide did occur soon after the church was built, demolishing part of the "East" end, so the opportunity is now being taken of moving the church forward towards the sea, which is rendered possible by the demolition of the intervening houses.

The interior of the new church will be very simple and cheerful as befits a modern seaside church, and the Rector, Canon Griffiths, has great ideas of introducing light-coloured frescoes to illustrate the sea-faring and fishing episodes in our Lord's life; but this will depend on a suitable young artist being available in years to come when church building has ceased to be controlled—if all artists have not died out by then!

There are many charming streets and houses of Regency date left in Hastings and St. Leonards, including a miniature crescent facing the sea immediately beneath the huge grey Castle Rock, which with its stuccoed front with iron balconies and a simple porticoed church of a contrasting scale in the centre is altogether charming, and despite its wartime lack of paint and upkeep, should be preserved at all costs.

Photo: Hedrich-Blessing Studio.

A View of the Athletic Field and High School

"ATOM CITY": OAK RIDGE, TENNESSEE

SKIDMORE, OWINGS & MERRILL, ARCHITECTS

On November 2, 1942, Oak Ridge—the "Atom City"—did not exist even as a name. To-day it is the fifth largest city in Tennessee, a thriving community of 75,000 people. The total housing has now reached nearly 10,000 family units, 13,000 dormitory units, more than 5,000 trailers, and 16,000 hutments and barracks. Not unnaturally, nothing can be published of the vast scientific area, but the story of the building of the residential area, as given in a recent issue of the American *Architectural Forum*, is full of interest.

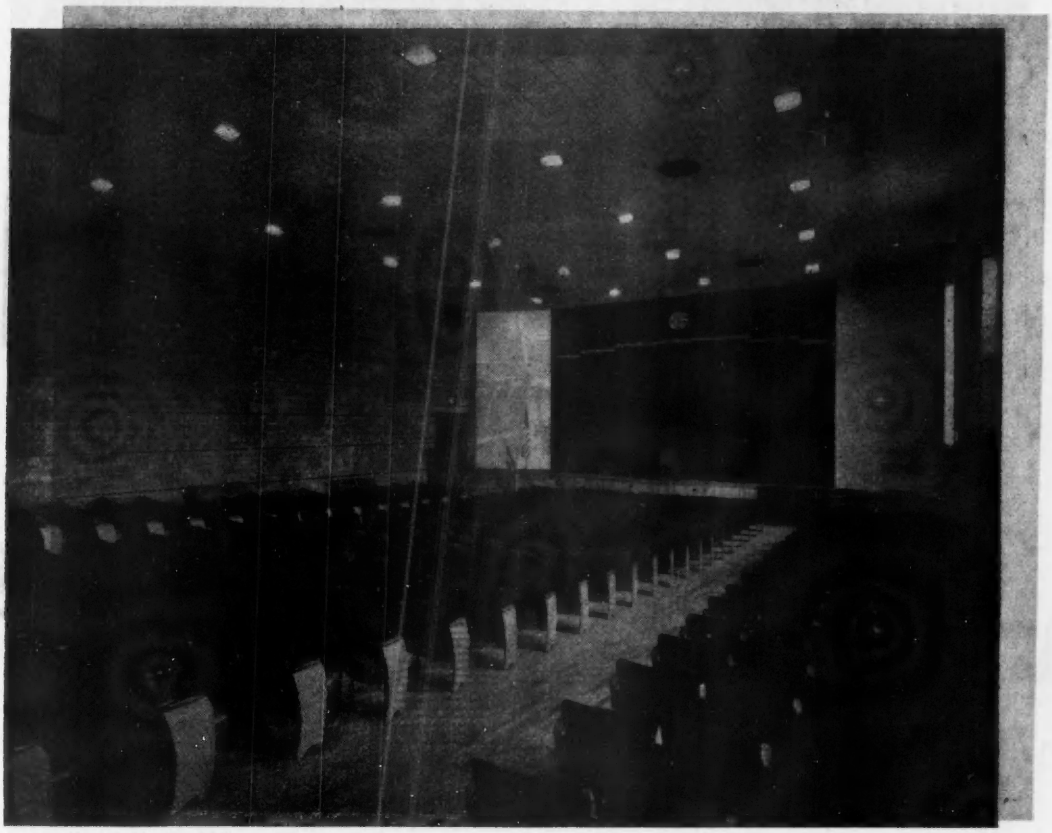
Choice of a site was dictated by the need for isolation and for vast amounts of cheap electrical power, obtainable from the Tennessee Valley Authority. The town occupies a strip approximately one mile wide and six miles long, stretching along a major ridge and intersected by minor ones. At present Oak Ridge is made up of four areas—East Town (Jackson Square), which extends east of the site's centre; East Village, further out; West Town (Jefferson Centre), on the opposite side of the town; and West Village, at the western outskirts, where the newest, marginal-type housing is still going up. The town, in fact, has far outstripped its originally planned size, and there is round the periphery a congestion of stark grey hutments, trailer camps, barracks, dormitories and administrative buildings. East Town was the original development started in February, 1943, and laid out for 3,000 houses. At that time no one had any idea of the expansion which would later cram temporary housing into every available chink of the town site.

Fortunately, the architects' site planning proved adaptable to rapid expansion on the difficult, hilly site. Simultaneously with the houses, roads and streets, sewers and waterworks, and elementary schools were planned. Shopping centres were provided, and a library, churches, hospital, dental clinic and recreative centres were provided. The expert integration of housing and community service buildings is an example of town planning at its best. The main centre at Jackson Square contains around its periphery a hospital, dental clinic, library and high school—one-of-a-kind facilities which proved adequate to serve the entire town. The central area itself is devoted to shopping and recreation, a two-section plan designed to flank a parking space. The two rows of buildings are connected at their base by a covered walk. Similar shopping centres are located throughout the town at appropriate intervals to provide quick and easy service for the scattered population. Group study and recreation facilities are an important part of the Oak Ridge plan. The community hall includes a public library, social rooms and a terrace for outdoor dining. The high school below is equipped with a gymnasium, auditorium, library and cafeteria, plus classrooms. In each case the U-shaped floor plan precludes a conflict between noisy and quiet activities, by placing them in separate wings. The excellently equipped high school buildings double as an extra recreation space for adults. Inter-city athletic contests are held here and the auditorium is used for concerts, church services and for little theatre group activities. The buildings themselves, although of inexpensive construction, conform to the most advanced principles of lighting, ventilation and space-use.

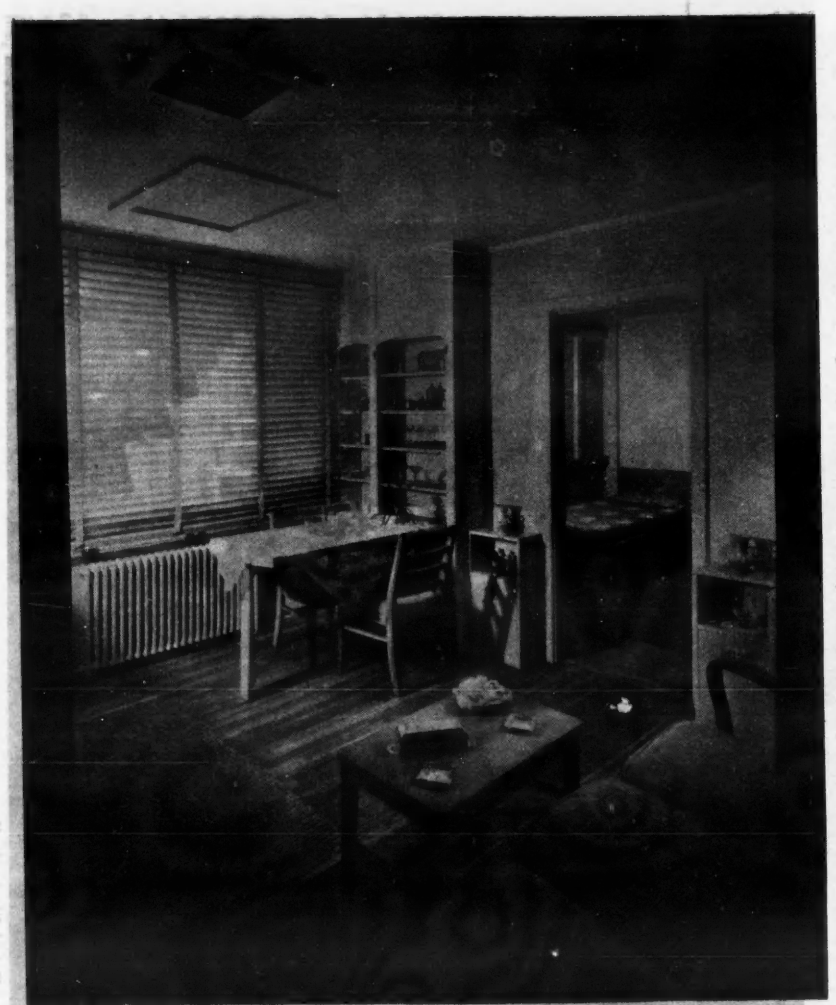
As a necessary alternative to single-family dwellings and a quick-housing measure to handle the periodic influx of new workers, various types of multiple dwelling units have become an important part of Oak Ridge building. Since a large part of the population consists of single men and women, minimum dormitories proved a practical solution to the gigantic need. Here room space was pared down to provide barracks-like sleeping quarters, with a combination bath-shower-laundry room servicing each wing of a dormitory.

As Oak Ridge expanded far beyond its original limits,

OAK RIDGE: One of the Eight Elementary Schools. *Below*: The High School Auditorium.



Photos: Hedrick-Blessing Studio.



Photos: Hedrich-Blessing Studio.

Interior of "Efficiency" Apartment House.

Foyer of "Efficiency" Apartment House.

"ATOM CITY": OAK RIDGE, TENNESSEE. SKIDMORE, OWINGS AND MERRILL, ARCHITECTS.

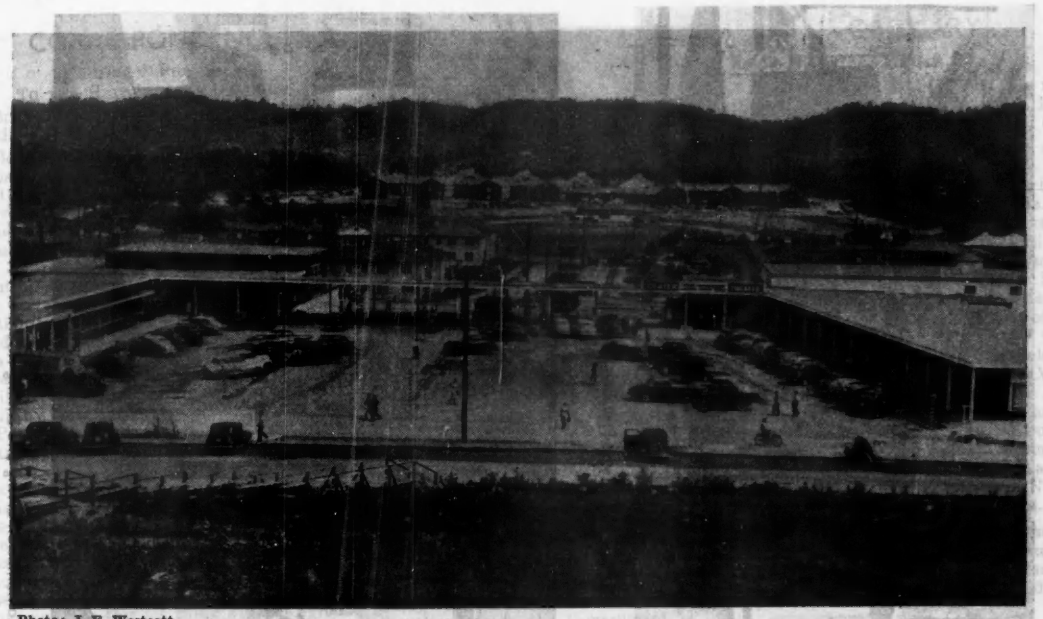
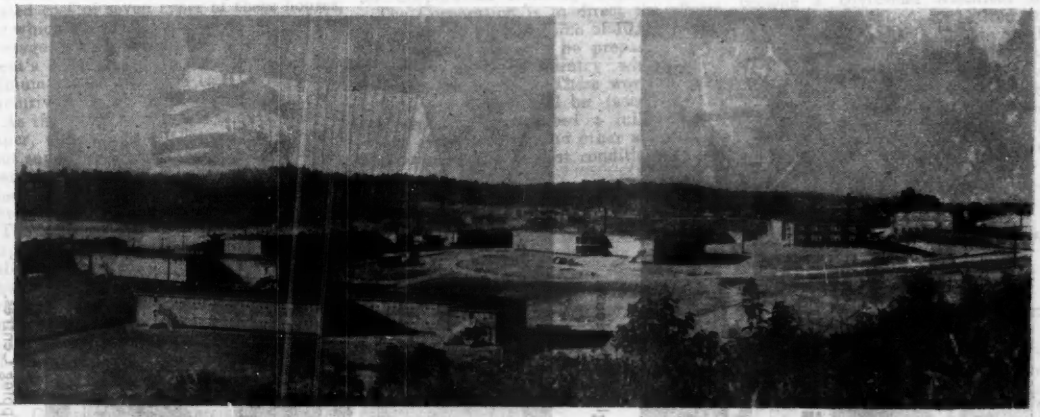


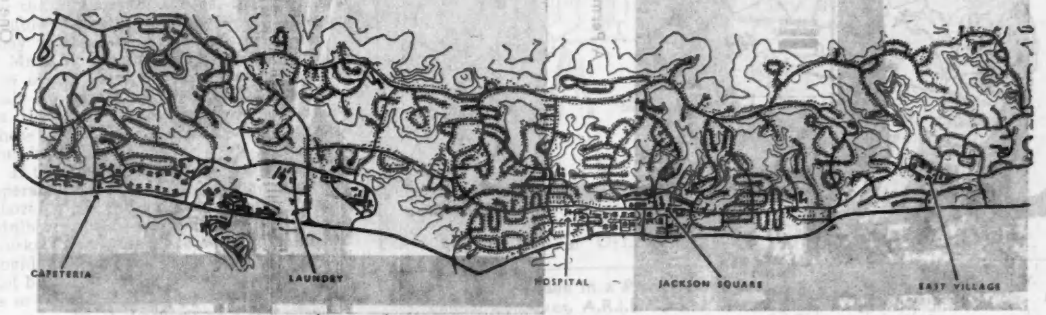
Photo: J. E. Westcott

Jackson Square, the Business Centre.

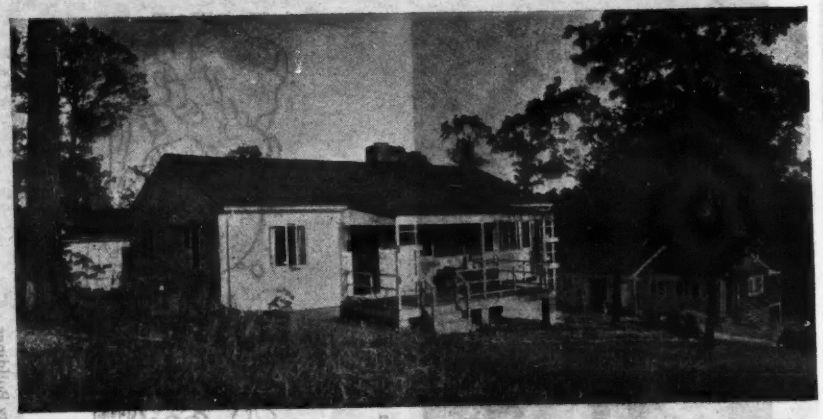
housing followed a trend towards cheaper and more temporary construction. The first 3,000 homes were permanent units, a Pierce Foundation design using prefabricated panel construction of cement asbestos board. These compact one-storey houses have an open, efficient plan which appeals to housewives in servantless Oak Ridge. Fireplaces, picture windows, built-in cupboards and a blower system of air circulation for summer as well as winter are interesting features not usually found in emergency housing. When 5,000 more dwelling units were suddenly requested, the T.V.A. type was adopted to cut labour time at the erection site.



Some of the Dormitory Blocks. 13,000 persons are so housed in Oak Ridge.



Layout showing Disposition of Amenity Buildings.



A Permanent Single-family House.

Photo: H. B. Smith.

A TVA Type Prefabricated House.

One of the Shopping Centres.

Combination Living and Dining Room of TVA House.

"ATOM CITY": OAK RIDGE, TENNESSEE. SKIDMORE, OWINGS & MERRILL, ARCHITECTS.

CORRESPONDENCE

Housing "Progress."

TO THE EDITOR OF *The Builder*.

SIR,—I was very interested to read the leading article on "Estimates and Costs."

Before the war four out of every five houses were provided by private enterprise, and one by local authorities, but the Government does not appear to want private enterprise help, and so are making conditions well-nigh impossible for houses to be produced by these means. The control of the issue of licences for building by private enterprise is left to the local authorities, and this varies from district to district, and in some districts no licences are being issued at all. The Minister has now decided that only one house is to be built by private enterprise to every four built by local authorities.

Prefabricated houses are being dealt with entirely by the Ministry of Works and not by the local authorities, and this means that the Government have full control of this type of housing, from the designing of the houses to the completion and handing over of the houses ready for occupation. In theory, one would think this should produce houses in the quickest time, at the lowest cost but, in practice, it does not work out like this. I think all will agree that the only justification for these houses is for them to be produced quickly and at low cost. The tenders are not let in open competition, as the Minister of Health insists local authorities should do with their permanent houses, but are let to certain selected firms of contractors, and these figures are not made public, even to those tendering for the houses, so that the actual cost of these houses is not yet known.

The Government have, however, published a White Paper, showing the estimated cost of seven types of these houses, for which they have placed contracts, at an average of £1,100 each, whilst the Government's estimate of the cost of the aluminium house is £1,365 each, both prices exclusive of land, roads and sewers.

As the aluminium house is only 638 feet super, this works out at about 43s. per foot super for a temporary ten-year house, instead of the 22s. which the Minister of Health says is the most he will allow for permanent houses.

The Ministry of Works are apparently not expecting any increased output of the prefabricated houses, as, up to very recently, they were still inviting tenders on the basic wage rate of 1s. 8½d. per hour for craftsmen, and allowing as claims all the additions to wages above that rate. This again shows how heavily the scales are weighted against private enterprise.

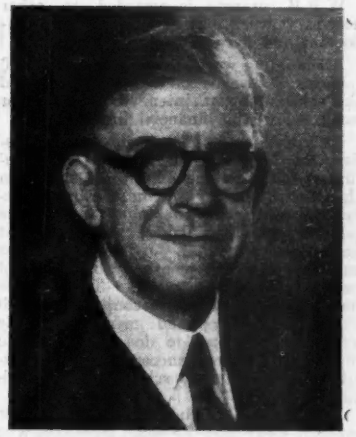
It does not make sense to me that, whilst the Government is exercising the most rigid control over the price of permanent houses built by local authorities and by private enterprise, they should allow temporary houses, to last ten years, sponsored by the Ministry of Works, to be built at double the prices per foot of floor space they will allow for permanent houses.

Much is also said lately about planning the countryside, but I am afraid this is only lip service as many of the best sites in the country are being desecrated by these prefabricated houses which will be our future slums.

If the building trade were allowed to co-operate as it did in producing, in a very short time, the camps, aerodromes, Mulberry harbours, and other important works for winning the war, the houses could very soon be produced, but this will not be done whilst the present stranglehold is so tightly held on the building trade.

W. J. RENDELL, F.I.O.B.

Devizes.



Mr. Luke Fawcett.

NATIONAL BUILDING CORPORATION

THE personnel of the National Building Corporation which the Government is to set up to assist local authorities in the rebuilding of certain towns heavily damaged in the raids is still officially unannounced. It can be taken as definite, however, that the Chairman of the Corporation will be Mr. Luke Fawcett, general secretary of the Amalgamated Union of Building Trade Workers. It is also understood that the managing director of the new Corporation will be Mr. William Smith, manager of the Manchester Corporation Building Department.

The Corporation is to direct the efforts of a mobile building force of 10,000 building workers who will be prepared to go to any part of the country where their services are needed. These workers, who will be volunteers, will be (according to one report) "guaranteed a full working week, given lodging and other allowances, and assured the highest conditions in the industry."

OBITUARY

Ralph H. Byrne, F.R.I.A.I.

It is with great regret that we record the death of Mr. Ralph H. Byrne, F.R.I.A.I., in Dublin, at the age of 68.

A. R. M. writes: Probably one of the busiest architects of our time, Ralph Byrne succeeded to the business founded by his father, the late William H. Byrne. His practice was a most comprehensive one, embracing, as it did, practically all branches of architectural work—schools, hospitals, conventual buildings, banks, and numerous churches, the last-mentioned being the most important body of his work. Mullingar and Cavan Cathedrals; the domed church of Sts. Peter and Paul, Athlone; the Chapel of the Convent of the Good Shepherd, Limerick; and a recent church at Cardonalgh, are all notable examples of these in the country. In Dublin the churches at Marino and Harold's Cross are landmarks, and in Dublin also is the well-known National Maternity Hospital in Holles-street.

Mr. Byrne had an illness some two months ago from which he seemed to recover, but the end came suddenly, to the grief of his large circle of friends.

Henry Blinman Mackenzie, F.R.I.B.A.

We regret to report the death of Mr. Henry Blinman Mackenzie, F.R.I.B.A., of Woodnook-road, Streatham, S.W., formerly of the Architects' Department of the London County Council.

Mr. Mackenzie, who died on April 17, joined the staff of the L.C.C. in 1903 as an architectural assistant. In 1926 he took charge of the Escape Section, and finally became a Divisional Architect in 1937, from which position he retired in 1944. He was directly responsible to the Head of the Architects' Department for the work of the Statutory Division, and advised on all matters relating to the construction of buildings under the London Building Acts. His work also dealt with the provision of the means of escape in case of fire from every type of L.C.C. building.

A Caricature made in a Prison Camp in Germany by P. L. Hansen Bay. Mr. J. Kennedy Hawkes, A.R.I.B.A., was in charge of architectural education. Over 20 prisoners passed their R.I.B.A. examinations.

BUILDING MATERIALS

PRIORITY DISTRIBUTION SCHEME

A PREFERENCE SCHEME for the distribution of building materials and components in short supply to builders on housing and other work of equivalent priority is to be introduced on April 25. The essence of the scheme is that manufacturers and merchants will honour orders supported by priority symbols before non-priority orders. Goods in short supply will therefore flow through normal trade channels to priority work. The scheme was outlined in detail in *The Builder* for April 19.

According to an official statement, priority symbols will be awarded to all work resulting in an increase of housing accommodation and to such other work as is essential to the national well-being. Production of the majority of materials will be adequate to meet the priority demand, but in very few materials will production be adequate to meet the total of priority and non-priority demands.

The priority symbol will consist of the name of the Licensing Authority, followed by the letters "W.B.A.," and an identifying number. Although other types of symbol, such as "W.B.B.," are in use in connection with labour supply, the symbol W.B.A. alone will be used for building materials and components.

Contractors will be able to quote a symbol only against the quantities of materials and components required for priority work. Contractors will be called upon to make a declaration that they have not quoted priority symbols for orders in excess of the authorised quantities, and they may not place the same priority order with more than one supplier.

The Government Departments concerned are discussing with manufacturers a means of spreading the load of priority orders evenly over the available capacity of the industries concerned.

When the scheme comes into force manufacturers and merchants will have in hand their current volume of work. Since these orders were placed before the scheme existed they do not carry priority symbols. Licensing authorities will therefore issue priority certificates in respect of outstanding W.B.A. projects. Although this involves extra work at the outset, it is clearly the only way of ensuring that priority work started prior to April 25 benefits as much as priority work started subsequently.

Building Priorities.

Building priorities are granted by Building Committees of the Government Departments concerned on application of the Government Department responsible for sponsoring each class of essential work. Two classes of priority are already in use for labour supply purposes. These are "W.B.A." and "W.B.B." W.B.A. priority will carry the preference for building materials.

Work resulting in an increase of housing accommodation has W.B.A. priority. Such work includes the erection of and site preparation for :—

Houses, flats and other dwellings;

The rebuilding of "cost of works" payment houses;

The repair of C (b) houses on a lump sum or fixed fee basis;

Any other work resulting in an increase in housing accommodation; but not war damage repair work to a house already occupied, which does not increase the amount of housing accommodation.

W.B.A. priority is also granted to a limited number of other essential projects, e.g., work on essential public utilities and factories.

W.B.B. priority is awarded to other necessary work but not to all less important and luxury work.

All building work costing more than £10 requires a licence or authorisation, and the scheme is not intended to cater for work below this financial limit.

In introducing the scheme on Wednesday, the MINISTER OF WORKS (Mr. Tomlinson) said that the scheme differed from the labour priority scheme in that it depended entirely on the importance of the job irrespective of where the job might be. The production of materials was sufficient to meet priority work but not priority plus other work. The scheme had been worked out in conjunction with the manufacturers and merchants. He asked the industry to do their best to make the scheme a success. The alternative was a statutory scheme, with penalties.

In reply to a question, the Minister made it clear that the small merchant who sold small amounts of priority materials under the £10 limit would not necessarily get replacement of the materials.

BUILDING AND THE GOVERNMENT

L.M.B.A. PRESIDENT ON OBSTACLES TO PROGRESS

"No industry to-day can exist unless it is meeting a social need, and meeting it efficiently," said MR. E. W. GARRETT, President of the London Master Builders' Association, at a meeting of the Association's Northern Area in Crouch End on Wednesday, April 17. "If, therefore, we want to maintain our position as employers of building trade labour we have got to prove and prove conclusively that we can do the job better than the State could do it."

"We know by now," proceeded the speaker, "that there is not sufficient material with which to erect houses which do not conform to the standard type usually associated with municipal housing schemes, and whether we agree with the Government's policy or not, we can see the reasons behind its decision to concentrate on this type of house and to place its contracts through the local authorities. Well, we can work to that plan, but I sometimes find it a bit difficult to reconcile the desire of the Government for houses with the obstacles which are apparently placed in the way of those who are anxious to erect them.

"We are told—and every party agrees—that if we are to have stable industrial conditions we must have security for the people. I maintain that if builders are to give of their best they must feel that there is also an assured place in the social structure for them. They can then feel justified in looking to the future with confidence and building up their organisations on a long-term policy. I say this because we are told that a Government building company is to be set up. Ostensibly, it is to deal with the special problems of the badly 'blitzed' towns like Plymouth and Coventry, and there may be some justification for it, though personally I doubt it. One of its other duties is said to be the building of houses in areas where local authorities have been slow in getting to work. In cases where local authority programmes do not coincide with Government policy the Government may reasonably enough step in, but there seems to me to be no reason why the contracts for the houses wanted should not be placed direct with local builders by the appropriate Ministry. For it would be a lamentable situation if builders in any particular district were suddenly to find the State coming in as a competitor merely because the local authorities were not alive to their responsibilities.

"To expand with efficiency the building industry must have confidence in its future, and while doubts remain about the Government's intentions these doubts must prove a serious brake on progress. I therefore appeal to the Government to let us have a clear and concise statement of the part, if any, they propose to play in the industry. What limitations, for example are set in the process, already announced by the Government, of 'going into business in a big way'? Once we know what part the State reserves for itself and what part builders are to be allowed we can go forward knowing that we shall be safe to plan for the future."

R.I.B.A.

MEMBERSHIP

ON April 9 the following members were elected :—

AS FELLOWS.

L. B. Baillon (Northampton). E. D. W. Mills (London).

AS ASSOCIATES.

Major E. W. Cowell (Kettering). A. B. V. Good (London).
M. J. Curran (Kilkenny, Eire). Capt. A. E. Matthews, R.E. (East Croydon).

AS LICENTIATES.

E. A. Beaumont (London). J. Kirsop-Webb (Wallington).
R. W. Eglinton (Kingston-upon-Th.). B. Ledbury (Manchester).
A. Frankish (South Harrow). J. W. Manson (Bearsden, Dumbartonshire).
W. H. Hallam (London). G. W. Marchant (Bristol).
E. Holmes (London). F. E. Moore (Bebington, Cheshire).
W. T. Hooper (Twickenham). Capt. H. G. Payne, R.E. (Bromley).
Major G. W. Hughes, R.E., M.B.E. (Aylesbury). Capt. C. E. Petch, R.E. (Keymer, Sussex).
C. Johnson (Richmond, Yorks). R. C. L. White (Leicester).
Major H. Kingham (Kirkcaldy). H. R. Williamson (Musselburgh, Midlothian).
W. Kinloch (Kingston-on-Spey, Morayshire).

The following overseas members were elected :—

AS FELLOW.

Professor E. R. Arthur, M.A., B.Arch. (Toronto).

AS ASSOCIATES.

A. Bolot (Kingsford, N.S.W.). M. H. McKenzie, B.Arch. (Auckland).
G. A. McKenzie (Kingsford, N.S.W.).

FINAL EXAMINATION : DISTINCTION IN THESIS.

The following students have been awarded a mark of distinction for their Final Examination Theses : F. H. Kerr, G. A. Atkinson.

Journals for the Troops.

MRS. E. V. PENN, General Secretary, Association of Building Technicians, writes : Throughout the war the A.B.T. has maintained its "Journals for the Troops" scheme, which organises the sending of building journals to technicians in the armed Forces. I should like to use your columns to thank all those who have so kindly supported the scheme by sending along their journals when they themselves had finished with them, and to emphasise how many letters of appreciation have been received by the Association. At the same time, however, I should like to point out that there are still many thousands of building technicians in the Forces in this country and overseas. On their behalf, therefore, I should like to renew our appeal to readers to send any technical journals to the General Secretary, Association of Building Technicians, 5, Ashley-place, S.W.1.

COST INVESTIGATION

SIR THOMAS BENNETT'S PAPER READ AT THE CHARTERED SURVEYORS' INSTITUTION

A DETAILED study of the subject of "Cost Investigation" was made by SIR THOMAS BENNETT, C.B.E., F.R.I.B.A., on Wednesday, April 17, when he addressed a meeting of the Chartered Surveyors' Institution.

Referring to the cost of building, the speaker said: It is a remarkable fact that an industry which is spending such a very large capital sum per annum as the building industry should have allowed its costing arrangements to remain on a vague and in many ways unsatisfactory basis. It is clear that the building industry saddles individuals and companies with the largest items on their capital expenditure accounts and with the payment of charges which are a very substantial part of their annual expenses. The cost of the building to the building owner is, therefore, of vital importance.

It is only in comparatively recent years that a large number of buildings of substantial size have been erected for purely commercial purposes, and therefore the commercial aspect of cost has an importance to-day which it did not possess fifty or more years ago.

Difficulty of Comparison.

One of the major reasons why the need for precision in cost has not been more readily accepted is undoubtedly the fact that it is extremely difficult to compare like with like in large buildings. It has been the custom in the past for large buildings to be erected by people who desire accommodation, and who are, in one way or another, in a position to meet the cost whatever it may be. That has applied, of course, to cathedrals, large Government offices, museums, town halls, the Bank of England and so forth. In many cases it has been far more vital to obtain a building which is fine architecture than to save money.

We may say that to-day the public require more and more buildings for public use, and are becoming increasingly conscious of the necessity for spending money well. The size of the building programme, coupled with the diverse nature of its requirements, means that methods of ascertaining costs which were sufficiently accurate for past requirements do not meet present needs, and will not meet the needs of the future.

Total Commitments.

The public company that is going to erect a building which must show a proper financial return and which in many cases is borrowing its money for this purpose clearly must know its commitments before it starts on a project. If the financial costs vary substantially from the first estimate, the whole scheme may involve the company in financial disaster. Costing in this class of building has, therefore, become a matter of necessity.

Public Expenditure.

This, however, is not the sole class of building in which precise knowledge of expenditure has become important. As more and more money is spent on housing below the economic level, upon education, upon health and other services which are supported by public funds, the public is becoming increasingly insistent that its money should be properly spent. It is, moreover, becoming familiar with the cost of accommodation which is standardised, and it is becoming more and more critical of those costs when it finds that they vary substantially. Moreover, statisticians have got to work and have produced series of figures which do not explain the different circumstances under which the buildings are erected; they reduce the total cost to cost per room, cost per bed or cost per man, and to those who have to work out such figures, it becomes common knowledge that an ability to plan a few more men or beds will very substantially alter the unit cost. It is, therefore, obvious that there are a great many factors which enter into the cost calculation and the statistical information which is deduced from those costs.

Preview of Expenditure.

The architect and quantity surveyor must acquire this cost sense, for indeed cost is quite as much a matter of cost realisation as it is a matter of actual figures and arithmetic. The cost sense to which I refer here deals with the power of the individual who is responsible for the building to see the total expenditure in which it will be involved as well as the actual cost of the structure itself. It means that the figures must be presented in such a way that a proper picture of cost is built up. I consider, therefore, that those of us who are responsible for advising on the expenditure of funds on a substantial scale must endeavour to acquire this cost sense. We must have in our minds, and indeed must clearly state, the items of cost which we have included and excluded, the items of cost which will be contingent upon our first estimate. We must point out the factors which will cause a variation of those costs.

I am sure that in the past this study of cost would have made greater progress if there had not existed certain measures of fear of loss of work which has permeated a good many people in the very bad years through which Great Britain has passed. In a country in which expenditure is immaterial, the desire to put the actual cost in front of the client is backed up by the knowledge that if that cost is high it will, in the broad issue, make no material difference to the project, and we cannot ignore this psychological factor in studying our own poor cost record. We are entering upon a period of full work for everybody as far as we can see, and from this very selfish angle it is a good moment to establish an accurate system of costing. I consider, therefore, the first rule of the cost picture is to have in mind a statement which will give: (*a*) The estimated cost of work as far as it is ascertainable. (*b*) The contingent cost, such as fees, loss of interest, and other charges, which will fall upon the client in his final payments. (*c*) The cost of items which may be necessary to bring the building into operation, but are not included in the estimate prepared by the architect or quantity surveyor—*e.g.*, furniture, plant, or equipment.

Costs under (*c*) will vary with different classes of buildings and with different clients. Some clients have an organisation which is capable of putting in the heating or electrical scheme and, therefore, all estimates of buildings must be prepared, excluding heating and electricity. Other clients can call upon their resources for one individual component, such as the provision of railway sidings. If no note is made on the estimates that these services are excluded, it is surprising how frequently the client himself or the responsible official fails to add the cost of his own service, and the final money approved by the head of the business, the controller of the service, or the official department, needs a supplementary estimate with a feeling of unfair reflection upon those who prepared the whole of the figures.

The speaker then presented a schedule which showed some of these items of expenditure, and continued: In actual fact four schemes were prepared, but I have only given the figures for one scheme since the remaining figures are merely a repetition of the same sort of items, of course with different sums of money entered under those headings. It should be noticed that there is a very substantial difference between the first figure in Scheme "A," a building cost of £212,500, and an actual cost to the client of £263,600 when his building is fitted up ready for occupation minus furniture. It is quite clear that the first figure is not the figure which is governing the desirability or otherwise of proceeding with the project, and it is equally clear that it is undesirable to send in partial sums hoping or believing that somebody else will be able to go through them, visualise all the contingent costs, add them in some satisfactory manner and arrive at the proper answer. I have found, indeed, by experience, that while this may happen in a perfectly intelligent and co-ordinated manner, it may also happen that either the essential items are only partially visualised or excessive sums are added with disastrous consequences to the cold consideration of the facts as they should be presented.

Possible Reductions in Costs.

Schedules which are produced to-day are complicated by many unknown items. Some of these complications arrive from the operation of the War Damage Act, and therefore it is essential to discover whether the property is to be classed as a value payment or a cost of works payment. Secondly, it is necessary to endeavour to assess the increase in the cost of the building over the estimated cost on the 1939 basis, and we therefore get two further assumptions which the intelligent presentation of a cost figure to a client must take into account in some form or other, and we also get the need for warnings that these figures may be substantially wide of the mark when actual payments come to be made.

Presenting a second schedule, the speaker said: Here I show an estimate of another building in which both of these items are of considerable importance, and which are duly taken into account in a somewhat substantial calculation to show to the client the actual cost of the building which he would have to anticipate. These estimates are given with the idea of showing what I would call the cost picture. It is only possible to prepare these estimates of cost in principle after the architects have made a certain number of drawings, and in so far as the cost picture may cause either: (*a*) the abandonment of the scheme; (*b*) very substantial modifications, that cost picture must be prepared at the earliest possible moment.

Method of Ascertaining Costs.

The industry has used the general methods of ascertaining costs by: (*a*) the price per foot cube: (*b*) the price per foot super. The figures which are used by a great number of people are based upon certain limited information obtained with their own experience and very often not carefully calculated even then. Of course there are a considerable number of architects and surveyors who keep very accurate records of the cost of the buildings they put up, and use these records as the basis of pricing future buildings, but the more I study the problem the more it seems to me that there should be much more extensive publication of figures, and this I hope to refer to later in making recommendations as to what should be done to improve the general estimating of the industry. The cube is, however, the accepted basis at the present time. It is subject to certain arbitrary allowances with regard to foundations and roofs. I have for long considered that the roof allowance is incorrectly balanced between the pitched roof and the flat roof, and I think a different allowance for flat roofs is quite wrong. I think it would be very much better to base all cubes on an assumed pitched roof or an assumed flat roof, and make some slight adjust-

ment which would be the result of actual ascertained cost. From time to time I have had quantities prepared for both pitched and flat roofs in order that I might ascertain the precise relationship between the two. In some the costs are almost identical, but in one post-war scheme the result has been as follows: Estimated extra difference in cost between pitched roof and flat roof, 12,900 cu. ft., at 2s. 1½d., £1,384; actual tender cost of the increase of the pitched roof on a curve over a flat roof, £1,330.

It should be noted here that the comparison is most unfavourable for the pitched roof since this building is built as a semi-circle, and the pitched roof with tiles has to be worked around the semi-circle and probably, therefore, is far more expensive than if it were a straight rectangle. Specifications are the normal specifications for working-class flats, concrete and asphalt in one case, pitched roof and tiles in the other, with parapet walls and gutters. As the variation on cube cost due to roof allowance is considerable, much more data are needed on this point, and further reference will be made later.

Variation of Unit Costs in Similar Buildings.

An examination of the actual cost of a large number of similar buildings brings to light a remarkable variation in the cost per unit. This is the sort of figure I have been keeping for a considerable number of years. Particularly was this the case while I was Director of Works at the Ministry of Works. Buildings erected to the same set of standard drawings on different sites showed costs which varied very substantially indeed. This is most disconcerting to the estimator who is attempting to keep a proper control over expenditure, and to the builder who may meet large differences in the actual cost of erecting similar buildings. I have had cases of similar buildings where one building as compared with another will exceed the cost by as much as 50 per cent., the unit of the cheapest building being of the order of £200, the unit of the dearest building of the order of £300. I have also found that the index value produced per man-hour in shillings is a very good indication of the efficiency of the erection of buildings. In one type of building it varied from as little as 3.8s. per man-hour to as much as 5.99s. per man-hour. Clearly with a variation of this sort, the contractor who is working with productivity of 5.99s. per man-hour is, or should be, making a greatly increased profit over the man whose production is less than four; while variations in actual value produced continue to occur in this way, we shall not get down to scientific costing or accurate control of cost, still less shall we get down to scientific estimating. Before we come, however, to consider the means by which the contractor is to achieve the estimated cost, I would like to carry the cost investigation to another stage.

Comparison of Buildings of Different Types.

I prepared, a few months ago, drawings for a scheme for working-class flats, and in order to try to ascertain the most economical method of developing the site, as well as the most desirable method of development, I prepared four schemes: (1) Consisted of flats of ground and three storeys without lifts. (2) A scheme which consisted of ground and five storeys with balcony approach served by lifts. (3) Buildings which consisted of ground and seven storeys served by lifts. (4) Buildings consisting of ground and nine storeys served by lifts.

In each case the accommodation was as nearly as possible the same, and the aim was to develop the site to a density of 100 persons per acre. A comparison of the resulting estimates was very illuminating. It was seen from the figures that the development of ground and nine storeys showed the most economical figures, that the next was ground and three walk-ups, then ground and seven, and finally ground and five with balcony approach. The figures were taken out very carefully, and there are certain factors which I will discuss in a moment, which suggest that it might not necessarily have produced the same result if full bills of quantities had been taken out for all four sets of buildings, and they had all been fully designed for this purpose. This, I think, is again one of the matters which need further investigation because it is more and more clear that our real basic knowledge of facts is a long way from being as accurate as we think it ought to be. Between the highest and the lowest of the figures which we are examining of these four buildings, there is a difference in total cost on estimated 1946 prices of approximately £20,000 and on a price per room, between the highest and the lowest, of £37. These are very substantial figures and quite clearly the decision as to which type of building should be built is one of very material consequence.

I realise that the final decision is not dependent alone on the question of cost, there are other factors such as the suitability of the buildings to the site, the amenities to the occupants, the desirability of housing large numbers of people in high or low buildings, and so on, but when there is a difference of £20,000 of expenditure then the question of costs must be one of those which are ranged side by side with the investigation of the drawings, amenities, and other factors concerned.

I would like to turn again to an examination of the figures for the working-class flats, because very considerable trouble was taken to work out the basis upon which they should be calculated, and to that end the estimate was divided into two portions; the first portion consisted of the estimate of the buildings on a cube basis, the second portion the estimate of the scheme with measurements of road, sewers, services and other things which would be varied as the result of using different types of buildings and, therefore, involving different amounts of services. In so far as the estimates of services were the result of quantities, they were as nearly accurate as it was possible to make them. When, however, we turned to the portions of the cost relating to the building cube, we found a certain number of anomalies which may or may not be a proper reflection of the cost of those items. There was the usual allowance of foundations up to ground-floor level, the measurement of sloping roofs on the basis of height equal to half the height of roof, and the measurement of an allowance on the flat roof of 3 ft. above the top ceiling level. An examination of the resulting schedule showed that the foundations for the ground and three-storey buildings were estimated to cost £22,880, the foundations of the building with ground and nine storeys £11,000, and the foundations of the building with ground and five storeys £17,300. Turning to the roof allowances the low buildings were to be roofed very largely with sloping roofs, and on the usual allowance on cube of half the height of the roof. The cost of roof allowance was just over £55,000, on the 100 ft. blocks the allowance was £6,000, on the 80 ft. blocks the allowance was £8,200, and on the 60 ft. blocks the allowance was £10,800. These figures are very substantial, and the differences are substantial, and it is quite clear that if those allowances are right then the cost of the low buildings in what one might call wasted money—*i.e.*, money merely spent in roofing the buildings, is a very big sum. I am not, however, at all satisfied that the allowances are proper and just.

I have instanced above the actual ascertained tender cost of changing a flat roof on a semi-circular building into a pitched roof, that is changing it on the most expensive basis. I do not for one moment believe that our present arrangement for estimating cost of roofs is right, and I think the professions should make an extensive examination into actual costs, and there should be some corrected figure for the guidance of architects and surveyors. However, the point that I am endeavouring to arrive at at the moment is to show that in dealing with the costs of any building, we are talking of figures which vary in thousands of pounds with a good deal of vagueness and a good deal of margin, and, therefore, unless these costs are put before a client with real intelligence, real ability, and a very considerable amount of judgment, there is room for a very large margin of error.

Measurement of Site Works.

An investigation of sites which are intended for such things as housing, hospitals, camps, hostels and so on, show, of course, that site works vary very materially in cost, and I think at times sites have been accepted as suitable for development where an accurate estimate at an early stage would have meant their abandonment altogether.

As another part of the cost investigation I consider that the site work should be measured and estimated at an early date in the development of the sketch plans, and before the site is actually acquired. There is, of course, at times an extension of a building which must take place whether the land is suitable or not, but in other cases the cost of the site works rises to such a very high figure that it would be far better to abandon the project and build it somewhere else.

Contingencies.

Under the heading of contingencies, the estimate again needs closer study of such things as are not immediately evident. I have in mind the places where sewers will not take the added sewage load, and it becomes necessary to lay down an addition to the sewage works, or even build a new one altogether. The same thing applies when the water supplies are insufficient, or the gas or electric mains will not carry the additional load, and it is often extremely difficult to see at an early stage that these items of expenditure will exist, and to make proper provision for them.

Firm Estimates.

All this shows that before the project proceeds very far a firm estimate must be in existence, and it is wise, therefore, when the sketch plans are finally stabilised and in a fairly concrete form, that the quantity surveyor and the architect should go over the whole thing again, with a fairly clear idea of the outline of the specification and with a very much closer estimate of cost. Now this estimate of cost brings us to the next stage, the consideration of what happens to the builder.

Costing System.

It has become more and more obvious that the building industry has no real costing system comparable to accepted factory costing for an article going through a factory. The reason is not very far to seek; in a factory there is stabilised plant, a line of production which alters very little, a type of product in which the cost is known before it is sold, whereas in building none of these things take place. On the other hand, I am quite satisfied that the comparative costs of building work are very much closer than we in the building industry assume they will be, and if the builder were to take out costs on a very much more complete scale than he has in the past, he would not be faced with the usual large unexpected "spill over" of expenditure. I also consider that it is essential that the same information should be in the hands of the professional man, otherwise he is quite unable to determine whether the charges put before him are reasonable.

Man-Hours of Different Firms.

In dealing with bomb damage repairs on the Ministry of Works Schedule, I arranged to make, some time ago, observa-

tions on a number of builders in different parts of one borough doing the same work to see whether it was possible to get a hard price on the repair of bomb damage work. Generally speaking, it had been assumed that this varied so widely in its requirements that it was not possible to arrive at a fixed price.

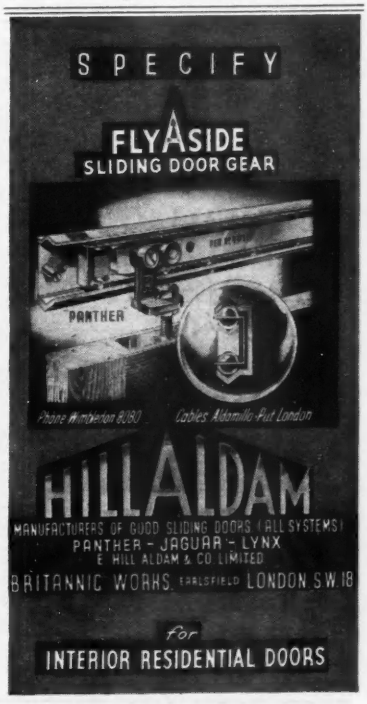
In the figures arrived at there was a remarkable uniformity. In one or two cases there were substantial variations, but when a general average was taken, and individual builders were examined, it was seen that there were cases where one or other of the builders was clearly working inefficiently. If the use of cost statistics of this kind became the custom of the industry, I am quite sure that we should find a very material improvement in the output, a very great tightening up of supervision, and ultimately a great saving in cost. Unless something of this kind is applied, we shall never be in a position to know whether the work is being carried out economically or whether it is not, and until that is known neither the builder, the quantity surveyor or the architect can really accurately price his estimate, nor can he know whether the estimate he is receiving is a proper figure, still less can he accurately negotiate a price. The more stable industries were some considerable time before they put down costing systems with big overheads which really costed the work, but I think no industrial organisation of magnitude today would ever go forward with its production without knowing exactly where it was getting proper output, where it was making a profit, and where it was making a loss. Moreover, sooner or later it is going to be essential that we should get some kind of payment by results for the workmen in the building industry, and unless we have records upon which to base a proper target figure there is very grave danger of starting as we did during the war with an unbalanced figure, where men on some operations can earn a substantial bonus with moderate work, and on other operations can earn no bonus at all with the hardest possible work. We must compare, therefore, building with other manufacturing industries; we must endeavour to find a simple costing scheme which will work on buildings, whereby we can tighten up the whole supervision of workmen.

Standard Man-Hour Production.

It is clear that the building industry lacks very badly really extensive examination and publication of figures which show standard man-hour production. This is needed, of course, on work of different grades; it is needed with accurate description, and it is needed as the average of a considerable number of observations, but I think it is one of those series of statistics which must be undertaken. It would be better undertaken, if possible, by a body like the Chartered Surveyors' Institution, but if they cannot find the money or produce the records then it should be published by the Ministry of Works, or some other Government Department. Until we have such a series of classified observations resulting from very widespread reports and apply them to a costing system which tells us how men stand compared with the ascertained average erection time of similar work, we clearly cannot tell whether our supervision is good, whether the men are being fed with materials at a speed which enables them to turn out the proper amount of work, or whether, indeed, the men are working themselves with reasonable skill and industry. Of course, this publication would be a very extensive document, it would have to cover all classes of building, it would have to cover buildings erected under different conditions, and it would have to endeavour to classify those conditions under headings so that when architects and quantity surveyors came to make estimates, there would be a clear indication of "standard output" comparable with the contract under examination. We should begin to have some clear indication of how far the addition of machinery to the building industry was really leading to increased efficiency and reduced costs, and that in turn would show the builder where he could save money by the use of machines. All of this side of the cost investigation of building is very loose, very ill-developed, and very unsatisfactory. Certain leading firms of contractors have their own sets of figures; it is possible those figures are very accurate, and it is possible that information therefore exists in a more extensive form than we think at present, but where it exists it is regarded as a kind of trade secret for an individual firm, whereas it should represent basic knowledge available for the use of the industry as a whole. I think, moreover, these figures should be corrected from time to time, they should be published for winter and summer. I am not in the least appalled by the size of the undertaking. I am quite sure that if it were properly studied and put in a proper form it would be an invaluable aid to the efficiency of the industry as a whole.

Claims.

With all these uncertainties and variations it might well be asked how has the industry succeeded in carrying on. I think the great majority of us would put our finger on one answer, and that is the practice of submitting claims—either claims which are considered to have a foundation in facts, or claims which are at times so politely called *ex gratia*. We are all familiar with firms of builders who get through their contracts and make the minimum number of claims. When we investigate the claims we are familiar with those which have every appearance of being honest, necessitous cases of getting back expenditure incurred. We are also aware of firms who appear to follow the policy of getting a contract at any price, being quite certain that there will be sufficient alterations in the drawings, sufficient changes in the conditions of working to enable them to make a profit out of the claims which may arise at a later date. This system of making claims is one of the bugbears of the industry, one of the disasters of cost control, and until we create conditions which make the frivolous claim impossible I am sure we shall not succeed in mastering the cost control problems. The first step, of course, is the issue to the contractor, or rather to the quantity surveyor at the time when he takes off his quantities, of a really complete and accurate set of drawings, the next step is a really complete and accurate set of quantities, and the third step is so complete an agreement with the client, and so good a knowledge of the conditions of the site, that the building is unvaried from the start to the finish. Unvaried is a big word; it may be possible to have small variations, but substantially we should know our buildings before we start to build. No other industry would attempt what the building industry does, *i.e.*, give an estimate of cost on the slightest possible information, irrespective of the fact that these figures may represent an expenditure of a quarter or half a million pounds, or even ten or twenty thousand pounds, or even a thousand pounds. Therefore, the first step in cost control is accurate knowledge, the second is refusal to alter. If both the principles became accepted practice in the professions, then the contractor who relied on making a profit on claims would be defeated with advantage to the whole building public. The claim is often the opponent of honest tendering. I glanced through a list of claims made to me a short time ago. While for some there was justification, others could only be regarded as attempts to get money to avoid a loss or enhance a profit—labour in glazing windows not covered by schedule—labour fixing windows in buildings after completion of brickwork—allowance for attendance on specialists claimed to be inadequate—fees to doctor for medical attendance on men—extra cost of working on sites which had trees—claim for difficult access—claim for loss of bulk in cement and concrete caused by using wind-blown sand and granite dust—additional preliminaries due to increase in the size of the contract—cost of clerical work in connection with workmen's hostels—cost of repairs to roads. It should be noted on these items a certain number of them have a superficial appearance of having a case. Many should have been covered in the tender, others were contingent on site conditions. This brings into view another of the items of cost control, viz., close supervision of site, and the keeping of diaries or records of a really accurate order, because as we all know it is characteristic of many claims of the unsound type that nothing is heard of them until the contract is finished, the contractor has cleared away and the final account has been measured.



Different Methods of Contracting.

Before we finally pass to a summary of the means which could be carried out to improve cost estimating, and cost investigation, a few comments are needed for comparison of cost between cases where prime cost is being worked, and where hard prices are being used. Again I draw from the experience of bomb damage which ran for an appreciable time on prime cost of necessity, and in certain cases has recently been turned over to fixed price. While running on prime cost, it would appear that something like 1,000 men were needed for work which, under fixed prices, can be done by 500 or 600. It may well be that there were extenuating circumstances, but one of the principal reasons is unquestionably the looser supervision which takes place where any type of prime cost work is being operated, and if the figures are right, then there is clearly a very big case for dealing with supervision, and for having test figures which will be the man-hour estimates of work of a certain class with which actual output can be prepared. I would like, therefore, to sum up the conclusions of this paper.

The Cost Picture. (a) That estimates of the cost of building work need a cost mind which visualises (i) the probable

expenditure in directions connected actually with the building, (ii) with its fees, (iii) with contingency expenditure, and (iv) points out factors which may otherwise affect the cost but are not necessarily included in the estimate.

Cost Information Service. (b) That in order to do this accurately very much better information is needed in the profession than is available at present, and that the architects and surveyors should institute a service by which a certain selected number of architects and architectural departments undertake to return, monthly or otherwise, the tender figures per ft. cube, per ft. super, estimated costs of buildings which they are erecting, and in due course to give a comparison with the actual cost on the same basis. By this means it would be possible to build up a reference document which could be published monthly, quarterly, or six monthly, and would contain actual costs of a large number of buildings. The professions would then know the range of costs of buildings of any character.

Costing Systems. (c) That costing systems of a very much more accurate order should be introduced into the normal operation of builder's work, so that there should be a standard by which the output of men could be ascertained and checked, and that the costing systems of certain manufacturing industries should be used as the basis to be aimed at.

Accurate Information. (d) That accurate information should be accepted as essential on all contracts, and in all bills of quantities. There should be universal effort to prevent the introduction of alterations in the contract while it is proceeding, and therefore a reduction in alterations to a minimum. This, apart from other desirable qualities, should aim at eliminating the bugbear of excessive cost in the industry, namely, "Claims."

Alterations and Effect on Cost. (e) There should be a much greater appreciation of the serious increases in cost which take place when delay in decisions or when alterations disorganise the flow of work on the contract.

Changed Plans. (f) There should be insistent and continuous impression on the public (in many cases this will mean the local authorities) of the costs of change of plans, delay in decisions, and other serious matters which would not be tolerated in any manufacturing industry, but which are common in building.

Man-Hours. (g) There should be a much better study of man-hours.

Published Unit Costs. (h) There should be clear figures published of comparisons in cost of construction on different types of building and different types of material.

FOUNDATIONS AND SOIL MECHANICS

THE PROBLEM OF SETTLEMENT

A PAPER on "Some Applications of Soil Test Results to the Design of Simple Foundations" was read by MR. GUTHLAC WILSON, B.Sc., M.I.C.E., at a meeting of the Structural and Building Engineering Division of the Institution of Civil Engineers on Tuesday, April 16.

The speaker said: A number of questions may occur to an engineer who is faced with the design of a foundation and who wishes to apply the principles of soil mechanics. Some of the more fundamental of these questions are: What tests should be made on the soil? How should the results of these tests be applied to the problem? What factor of safety should be adopted?

The economic factor is, in many cases, crucial in necessitating the adoption of a low factor of safety, particularly as the real factors of safety of the foundations of many existing structures are probably much below what the designers had expected, and yet the buildings still stand up. This being the case, there is a strong compulsion on engineers not to adopt higher factors of safety. This is not to say that an engineer is justified in following traditional practice even though his investigations and tests have shown him that this would result, for example, in serious relative settlement, with consequent cracking of finishes and damage to the building. It is obvious, however, that it will often be difficult to persuade laymen of the necessity to spend more to get a better job.

It will generally be found that to attempt to increase the factor of safety above 1.5 or 2.0 will necessitate the use of uneconomically large quantities of material. The principal exception is dense sand or gravel, in the case of which a small increase in width of foundation produces a considerable increase in the factor of safety. The factor of safety against ultimate failure should, therefore, usually be between 1.5 and 2.0.

Dealing with only one aspect of site investigation—the depth to which exploration should extend—the speaker said: It is evident that exploration should extend to the greatest depth at which the soil may be subjected to a dangerous increase of stress or at which the stress may be sufficient to cause undesirable consolidation.

Various criteria for the estimation of this depth are in use. In the United States the ready rule is "to one-and-a-half times the least width of the building"; in Germany the multiple of the building-width is made to depend upon the average bearing pressure, taken over the whole area of the base. The "width of the building" is taken as the overall width of the building—not the width of individual foundations — unless the distance from centre to centre of individual foundations exceeds five times their width, in which case the most unfavourable condition is found by consideration of an individual base.

It is worth giving some consideration to these rules. It must be remembered that such rules can be only a general guide to be applied in cases where there is no more reliable basis. These rules do not give either an upper or a lower limit; if rock is met with at less depth, it will rarely be necessary to go deeper, whilst, on the other hand, if such a depth has been reached and the strata are still alluvial it will be necessary to continue exploration at least to the maximum depth to which piles can be driven.

Some Test Hints.

Sands and gravels do not often present problems as foundation materials. In cases in which a study of the material is justified, the natural density should be determined; a knowledge of the failure characteristics at this density and of the critical density will generally form an adequate basis for design. The grain-size distribution may be a guide to the state of compaction; coarse sands and gravels tend to be compact in nature, whereas fine sands tend to be loose. Cohesionless materials may, however, present problems in the execution of foundation works, especially if they are water-bearing. In the case of clays and silts the most important factors are natural water-content, cohesion, and compressibility.

If the material is such that the use of piles might have to be considered, the cohesion should be determined in the remoulded state as well as in the natural state. If the cohesion of the remoulded material is appreciably less than that of the natural material, it is possible that the use of driven piles will result in settlements greater than would be experienced if a foundation without piles were adopted; in such a case a floating foundation or bored piles may provide the best solution.

In the case of a granular material, the depth of foundation to carry a given load depends on the width of foundation and can be determined readily if the angle of internal friction, the weight per cubic foot of the material, and the ground-water level are known. The economic depth and width can be estimated from the costs of excavation and of construction. If the material is loose in its natural state, and if heavy, extensive, or vibratory loads have to be carried, it may be necessary to resort to artificial compaction or to chemical consolidation. Loose sands are compacted by vibration. Explosives have been used with success on open sites. Pile driving has also been used frequently.

After referring to hydrostatic pressure on tanking caused by consolidation; piling and floating foundations, the speaker concluded: Settlement is a phenomenon which is often disregarded. The type of trouble that may be expected to result from settlement varies according to the type of building. In luxury buildings clad with veneers of marble, or even Portland stone, general cracking and spalling of the finishes may occur. In heavy brick buildings of the old factory type, or of steel framed buildings with heavy brick infilling, the structure may act as a rigid box and spread the load over the whole of the base, instead of only on the footing as intended; in such cases the earliest signs of trouble will appear at the corners, owing to the heavy concentrations of bearing pressure that are induced in these positions; these are likely to cause diagonal cracks in the brickwork. In steel framed buildings with thin brickwork or other stiff but weak panelling, general cracking of the panels may be expected; such structures are less capable of redistributing load than are their heavier forebears.

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IN PARLIAMENT

Housing, Financial and Miscellaneous Provisions Bill.

On the third reading LORD ADDISON moved an amendment to omit from clause 4 the proviso the wording of which he explained was objected to in the Committee Stage as unduly restricting the Minister's direction in connection with the standard Exchequer contributions to be paid for the building of houses as against flats on expensive sites. On the Committee stage he had undertaken to try and devise a form of words to meet the point, but the Minister was now prepared to omit the whole proviso.

The amendment was agreed to and the Bill read a third time.

Private Enterprise Housing.

Before Parliament adjourned for the Easter Recess, MR. D. WALKER-SMITH raised the question of the revocation of building licences. He said that this action meant that private enterprise was being still further restricted in an effort to maintain an artificial ratio between the rate of local authority building and private enterprise building. The Government were punishing the public by the revocation of these licences. The Minister's action was based on false premises. As regarded the first, in 1939 the Fitzgerald Committee's report on eight million dwellings showed that not 80 per cent., as the Minister had said, but 40 per cent. of the people of this country needed houses to let and were not in a position to buy them. The Minister was again wrong in saying that more houses were built in the six months following the end of the war than in the three years after the 1914-18 war. The actual figures were 2,045 and 100,000 respectively. Between 1919 and 1938 there was a steady increase both of ability and desire on the part of all sections of the community to own their own houses. Fifty per cent. of the clients of the building societies were drawn from the wage-earning classes. The conclusion was that the desire of owner-occupancy was deep-rooted in this country and the Minister was banishing the possibility of implementing that desire while quite unable to exorcize it. The contention that private enterprise did not build houses for letting did not bear examination. In the five years before the war private enterprise produced, unsubsidised, 1,316,000 houses. Of these 481,000 had a rateable value of not more than £13, 672,000 a rateable value between £14 and £26, and 163,000 a rateable value between £27 and £80. In the 2½ years before the war one-third of the houses built by private enterprise were built to let. Most of the houses of a rateable value up to £13 could be let at an unsubsidised rent of 8s. or 9s. a week, which was less than the 10s. rent which the Minister was aiming at and which could only be achieved by putting undue burdens on ratepayers. The February housing return showed that out of 1,500 local authorities 911 had not a single house then under construction.

The third false premise was that local authorities and private enterprise could not usefully engage in house-building contemporaneously on account of the labour and material situation. Before the war, out of a million building operatives, one-third were engaged on house-building, one-third on maintenance, and one-third on other construction. In January there were 750,000 building operatives available for work. In short, the labour and materials position positively invited the combined activity by both private enterprise and local authorities, and in so far as there was a shortage of bricks, the fault lay at the door of the Government. The Government were punishing the public by the revocation of licences to private enterprise builders because many local authorities had not their schemes ready and could not absorb the labour and materials released by the revocations. In Wokingham, for example, 48 building licences were revoked out of 72, but in February only four tenders for local authority building in Wokingham had been approved. What was to happen to the labour and materials of the other 44? Other local authorities could not take advantage of it unless there was mobility of labour, and was the Minister prepared to direct labour in order to ensure that mobility?

Replying to this speech and to others made in the subsequent debate, MR. BEVAN said that the most urgent thing at the moment was to provide houses for need. There were more ex-Service men and others who could not afford to buy a house than those who could. There was not enough labour and materials to meet everyone's need, and it was necessary that those who could afford to buy a house should not be allowed to build in excess of those who wanted to rent houses. A local authority ought not to allow more than one house to be built for purchase as against four to let. Some local authorities had exceeded that proportion. All over the country evidence was growing that local authorities were doing the job that was expected of them. The impression that the Government were against people owning their houses was entirely untrue, but the Government were determined to prevent people who wanted to buy their own houses from paying extortionate interest to moneylenders. Conservative members must remember their own miserable record in regard to housing and remember that the main sufferings of our people in that respect lay at the door of the most useless Party that ever existed. At the end of four years of the present Government he would be able to show a better building record than that shown by the Tory Government at the end of 15 years. Some local authorities had, quite foolishly, cancelled licences for houses which were already building although there was nothing in the instructions he sent out to give the impression that this should be done. Whenever that action had been taken the position had been examined and building had been resumed.

Black Market in Building.

Replying to a motion for the annulment of the Order in Council amending Regulation 56A of the Defence (General) Regulation, 1939, and the Defence (Recovery of Fines) Regulation, 1942, MR. H. J. WILSON, Parliamentary Secretary to the Ministry of Works, said that the black market building work was, in view of the country's housing situation, a serious anti-social offence deserving of heavy penalty. Control of the food trade had been accepted as right and necessary in our present condition, and the country had approved the infliction of stiff penalties on those who contravened the food regulations. It could not be argued that the provision of homes and shelter was less important, or that those who offended in this respect should be more lightly treated than those whose offence was in respect of the food black market.

The Order they were discussing provided heavier penalties for a breach of Defence Regulation 56A, which came into force in October, 1940, and which prohibited all building work undertaken without authorisation or licence except within the financial limits prescribed by M.o.W. Order. These limits were at present £10 on any single property in the current period of six months, plus two pounds' worth of work in each calendar month. At the outset, the financial limit was £500, but this was reduced in April, 1941, to £100 in any period of 12 months. Following the V-weapon attacks it was further reduced to £10 first in London, then in other areas of Southern England, and on March 22, 1945, the then Minister of Health in the Coalition Government announced that in view of the need for concentrating the maximum possible force of labour—and materials—on house-building and house-repair, the limit was to be fixed at £10 for the whole country. On June 5 the Parliamentary Secretary to the Ministry of Works in the Caretaker Government announced that this extension would have effect from August 1, 1945.

No one who really wanted to see the housing drive succeed, and who studied the facts of the building situation to-day could ask for the control to be lifted. In spite of the rapid expansion of the man-power of the building and civil engineering industry in the last few months, it was still impossible to meet all the demands that could be placed on it in a free market, and impossible to meet the priority requirements without strictest control of less essential work. It was not generally realised that the number of building trade operatives employed on repairs and maintenance to housing alone before the war was as big as the number employed on new buildings. Those arrears of maintenance were so great that if we did not control them they would be enough to employ a labour force equal to the whole present man-power of the industry for at least a year to come, without leaving anyone for housing or other essential work.

Why were the existing powers under Regulation 56A inadequate, and why had this new Order been found necessary? Because there had arisen a large and most malignant black market in unessential building—hundreds if not thousands of cases of building far in excess of licences which have been issued. It meant that property-owners were gratifying their desire for improvements in their houses, or for changes in their places of business—a very large proportion of cases brought were night clubs, restaurants and so on—on a scale sufficient to endanger the housing programme, by preventing the deployment of enough men on housing and other essential work. Such property-owners, he knew they were a small minority, and the builders who collaborated with them and often led them on, again a small minority, tempted by the higher profits they could obtain, were not merely deliberately flouting the law. They were standing in the way of someone, in far greater need than themselves, getting a house. That sort of

activity was not merely a technical offence: it was a selfish and an immoral course of action.

In answer to questions, MR. WILSON said he thought the number of prosecutions in the last six or seven months had been about 75. The number of cases where it might have been possible to prosecute was about 100 times that number.

MR. LENNOX BOYD said that seemed to be an extraordinary reflection on the law Officers of the Crown.

The motion was rejected by 282 votes to 76.

Bricks.

In reply to MAJOR TUFTON BEAMISH, MR. TOMLINSON said the estimated number of productive manual workers engaged in the brick-making industry was 55,000 on March 31, 1938, 11,000 on May 8, 1945, and 23,500 on March 31, 1946. The number of bricklayers aged 16-64 insured against unemployment in the building industry in Great Britain was 109,210 at July 1, 1938, and 48,390 at July 1, 1946. The number at March 31, 1945, is estimated at between 70,000 and 75,000.

Brick Production.

MR. TOMLINSON told MR. D. J. WILLIAMS that the brick production figures for Wales during the last six months were as follows:—

September, 1945	6,572,000
October	7,323,000
November	7,771,000
December	6,895,000
January, 1946	8,661,000
February (28 days) ...	8,613,000

Tiles and Bricks.

In reply to MR. EDWARD DAVIES MR. TOMLINSON said that the average percentage increase over 1939 prices was approximately 75 per cent. in the case of tiles and 70 per cent. in the case of bricks.

Iron and Steel.

THE MINISTER OF SUPPLY, in a statement on the subject on April 17, said that the House would remember that on November 19 last, in announcing the Government's plans for the socialisation of industries, the Lord President of the Council stated that the Coalition Government had invited the iron and steel industry to submit a Report on the improvements required to put the industry on an efficient operating basis, and that H.M. Government proposed to await this Report before taking final decisions on the future organisation of the iron and steel industry. A Report prepared by the British Iron and Steel Federation was received and had been considered. It set out plans for the development and modernisation of the industry over the next five to seven years at an estimated cost of £168,000,000. Proposals were also made to effect a certain rationalisation of production in order to achieve maximum plant efficiency. Reports had also been received from the Joint Iron Council dealing with the foundry iron and iron foundry sides of the industry.

Mr. Wilmot continued: "The Government welcome these Reports as an important contribution to the planned development of this basic industry. After full consideration the Government has reached the conclusion that the position of the industry and its importance in the national economy necessitate a large measure of public ownership, and that legislation for this purpose should be prepared.

"Meanwhile, immediate discussion will take place to ensure that urgent modernisation and development schemes are carried through without delay. The Government are anxious to secure the utmost co-operation of both managements and workers during the period which will be necessary for the preparation and putting into effect of the scheme of public ownership. For this period I propose to establish a Control Board. This Board will replace the existing Iron and Steel Control and will be responsible to me for the general control and supervision of the industry. The Board will pay special attention, in consultation with the industry, to facilitating the early execution of the urgent development schemes. The Board will also act as my advisers on questions arising in the preparation of the scheme of nationalisation, including the definition of the sections of the industry to be taken into public ownership."

Cost of Temporary Houses.

In reply to MR. W. SHEPHERD, MR. TOMLINSON said that the average ex-works cost of the factory-produced temporary houses, including the aluminium houses, was approximately £690. This figure included fixtures and fittings. The site work and erection was carried out under competitive tender, and it was not in the public interest at this stage of the programme to publish the average cost at which it had been possible to have this work carried out.

George V Memorial.

MR. HOGG asked the Minister of Works what buildings it was proposed to demolish in order to make a space for the proposed George V Memorial.

MR. TOMLINSON said that the scheme approved by Parliament in 1939 for the Memorial required the eventual demolition of No. 5, Old Palace Yard.

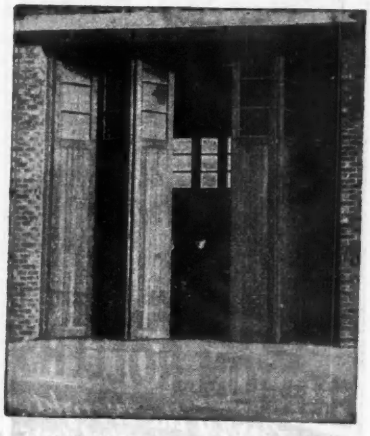
New Towns.

MR. DE LA BERE asked the Minister of Town and Country Planning whether, arising out of the Interim Report of the New Towns Committee, he would give an assurance that he would, as far as practicable, confine major expansion to larger and more industrialised towns since small towns were generally dependent for their existence on the surrounding country area.

MR. SILKIN said that the extent to which it was practicable to make major expansions of the larger and more industrialised towns was dependent on a number of complex factors such as transport, public utility services, and employment needs. Accordingly it was not practicable to confine major extensions altogether to towns of this kind.

On April 17 Mr. Silkin introduced the New Towns Bill to provide for the creation of new towns by means of development corporations.

KING SLIDING DOOR GEAR



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Production of Plywood.

FLIGHT-LIEUTENANT HAIGE asked the President of the Board of Trade what was the average monthly production of plywood in this country in 1939 and for the first three months of 1946; what were the average monthly imports for the same period; and what were and are the main sources of supply outside this country.

MR. BELCHER said that no official statistics of plywood production in this country in 1939 were available, but information obtained from trade sources indicated that average monthly production of commercial plywood was about 500,000 sq. ft. The corresponding figure for the first three months of 1946 was 5¾ million sq. ft. per month. Imports during the first eight months of 1939 averaged 50 million sq. ft. a month. For the first three months of 1946, the figure was 25 million sq. ft. a month. The main sources of supply outside this country before the war were Finland, Russia, Latvia, Poland, Japan, Canada, U.S.A., and France. At present they were Canada, U.S.A., Finland, Brazil and Sweden.

Official Architects.

MR. BOSSOM asked the Minister of Works whether it would be the policy of the Government, when important national buildings were to be erected, that the architectural work of these should be done by permanent officials of his department or the Ministry of Health; or whether it would be open to selection of an independent architect by competition or some other suitable method.

MR. WILSON said that no change was contemplated in the policy before the war by the Office of Works in respect of important national buildings, which was to engage nominated architects of high merit for such works. It was the intention in future to meet fluctuating demands for Government buildings so far as possible by employing architects in private practice to a larger extent instead of, as hitherto, meeting fluctuating demand by taking on and discharging unestablished professional staff.

New Factories.

MR. BOSSOM asked the Minister of Works whether he would state the number of new factories actually being constructed in Great Britain at the present time; and on how many of these completion was being prevented or delayed due to absence of piping, either iron or lead, and the inability to obtain the necessary paint.

MR. WILSON said that since June, 1945, licences had been given for the construction of between 900 and 1,000 new factories, but without further detailed inquiry it was not possible to give the number under construction on a particular day. His Department had not received any representations with regard to delay in the completion of factories due to shortages of lead or iron piping or of paint, but if the hon. Member would let him have particulars of any case that he had in mind he would be glad to have inquiries made immediately.

Operatives' Pay.

MR. W. SHEPHERD asked the Minister of Works what percentage of increase in output had been obtained as a consequence of the rise in pay to building trade operatives.

MR. TOMLINSON said that the rise in pay to building trade operatives was only one of a number of factors affecting the rate of output in this period of transition from war conditions, and he was unable to say precisely what effect it had had as yet. The two sides of the industry had set up a National Joint Production Council with the object of securing a higher rate of production.

PERMANENT HOUSING, ST. MARYLEBONE

St. Marylebone Council propose next month to invite tenders for the erection of multi-storeyed blocks of flats on the following sites:—Church-street: 140 Flats, 11 Shops. Area of Site 3.37 acres. Architects: Messrs. Stanley Hall and Easton and Robertson, 54, Bedford-square, London, W.C.1. Quantity surveyors: Messrs. Crosher and James, Bank Chambers, 329, High Holborn, London, W.C.1.

Barrow Hill-road: 172 flats. Area of site 4.39 acres. Architect: Mr. Louis de Soissons, A.R.A., F.R.I.B.A., 21, St. John's Wood Park, London, N.W.8. Quantity surveyor: Mr. Sydney A. Paine, 2, New-court, Carey-street, Lincoln's Inn, W.C.2.

Bills of quantities for each scheme are in course of preparation and will be available for issue in May, and the Council are desirous of receiving tenders for each scheme on or about June 20 with the object of work being commenced as soon as possible thereafter.

In the meantime contractors interested in either of these schemes are invited to inspect the sites and the working drawings by arrangement with the respective architects or quantity surveyors.

TRADE NEWS

A Patent Flooring Method.

At a time when the reduction of site man-hours is a factor of importance in the nation's building programme, of especial interest is the design and construction of Opperman Patent Floors, manufactured by Messrs. S. E. Opperman, Ltd., Stuart Works, Boreham Wood, Herts. Suitable for all types of houses, these floors are constructed of steel frames fitted with short lengths of tongued and grooved wooden boards rigidly held by invisible fixings. The boards are sanded, stained, polished and covered with a waterproof protecting material. The steel frames, which can be supplied in units to suit any specification, incorporate a device for fitting ceiling boards to the underside.

Broad Flange Beam Development.

The works executive and the heavy mill team of the Cargo Fleet Iron Co., Ltd., Middlesbrough, have been applying themselves to the production of broad flange beams, without the colossal expenditure generally accepted as being necessary for new mill equipment. The result is the successful production in large quantities of one of the medium broad flange sections mostly in demand, namely 10 in. by 10 in. in lengths up to 90 ft., and of a quality and finish strictly comparable with the best Continental and American standards. The management are now proceeding to develop from the smallest range of sizes up to 20 in. by 12 in. to meet steel constructional requirements.

A Combined Clothes and Washing Machine.

Known as the Thor "Automagic" washer and claimed to be the first combined clothes- and dish-washing machine to be manufactured, a recent electrical invention is shortly to be produced by the Hurley Machine Co. (England), Ltd., Oxford-street, London. The machine is enclosed in a compact cabinet 2 ft. square and 3 ft. high, and finished in white enamel. No bolting to walls or floors is necessary. Separate lightweight washing tubs are provided for clothes and dishes, and after the loaded tub is inserted in the machine all other operations—washing, rinsing and drying—may be effected by the manipulation of an external switch. The machine is designed for alternating current.

NEWS ITEMS

New Electrical Wages Agreement.

The National Federated Electrical Association, Africa House, London, W.C., has published a new wages agreement for electricians which gives effect to the decisions reached by the N.J.I.C. at its meeting held last month.

Catalogues and Agencies Wanted.

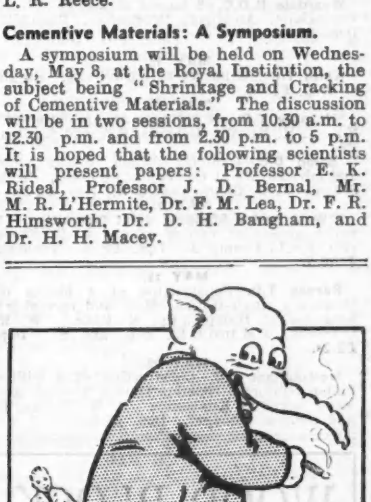
Tee Beam Structures, Ltd., Galle, Ceylon, and Tee Beam Structures (India), Ltd., Bombay Mutual Buildings, Hornby-road, Bombay, notify us that they require trade catalogues and agencies, covering every branch of the building and engineering trades, also agricultural machinery.

Demolition Contractors' A.G.M.

The fifth annual general meeting of the National Federation of Demolition Contractors was held in London on Tuesday, March 26. Mr. C. S. Willment was unanimously re-elected president for the fifth successive year, and Mr. A. G. Griffiths was elected vice-president. The following were elected members of the Council: Messrs. J. H. Flack, A. G. Foster, F. Hardwick, H. W. Norris and L. R. Reece.

Cementive Materials: A Symposium.

A symposium will be held on Wednesday, May 8, at the Royal Institution, the subject being "Shrinkage and Cracking of Cementive Materials." The discussion will be in two sessions, from 10.30 a.m. to 12.30 p.m. and from 2.30 p.m. to 5 p.m. It is hoped that the following scientists will present papers: Professor E. K. Rideal, Professor J. D. Bernal, Mr. M. R. L'Hermite, Dr. F. M. Lea, Dr. F. R. Himsworth, Dr. D. H. Bangham, and Dr. H. H. Macey.



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Thermal Properties of Copper.

"The Thermal Properties of Copper, with Particular Reference to Copper Pipes," is the title of a booklet recently published by the Copper Development Association. The author, G. W. Preston, M.B.E., A.M.I.E.E., discusses the characteristics of copper compared with those of some other commonly used metals, and also deals with the heat capacity of, and heat dissipation from, copper pipes.

Combustion Appliance Makers' Association.

The annual general meeting of the Combustion Appliance Makers' Association (Solid Fuel) was held on Tuesday, April 16. The Report states that the association has secured for itself recognition of its competence to represent the collective interests of the whole industry and those of particular sections, and is so regarded by the Ministries, particularly those of Fuel and Power and of Supply, and goes on to point out that the close relations so established are to be regarded as especially important at a time when the whole structure of the coal industry is under revision.

THE SCOTTISH BUILDER

NEW BUILDINGS

Dumbartonshire.—Alterations and additions to be carried out at South-st., Scotstoun, by the Albion Motors, Ltd.

Glasgow.—New storage buildings and workshops to be erected at Coventry-drive by Acrow (Engineers), Ltd., 196, Bath-st., Glasgow.

Glasgow.—Plans prepared for 45 four-apartment houses at the Kingston housing site to be erected by Messrs. McTaggart & Mickel, Ltd., 65, Bath-st., Glasgow.

Glasgow.—The Corporation to erect 82 houses at Barrowfield, for which the architect is Ronald Bradbury, 20, Trongate, Glasgow.—Plans in hand for alterations and additions for William Collins & Sons & Co., Ltd., at Hyndlands-rd., for which the architects are Wylie, Shanks & Wylie, 204, West Regent-st., Glasgow.

Glasgow.—Plans in hand for reconstruction, alterations and additions for the Dawsholm Paper Co., Ltd., at Maryhill, for which the architects are Messrs. Weddell & Inglis, 246, Bath-st., Glasgow.

Glasgow.—Plans prepared for alterations and additions at 33 to 41, Brown-st., for the Caledonian Tyre Co., Ltd., for which the architects are Messrs. Gillespie, Kidd & Coia, 19, Waterloo-st., Glasgow.

Motherwell and Wishaw.—Dean of Guild Court passed following plans:—Scottish Housing Association, Ltd., to erect 26 concrete-type houses and 70 Weir-type prefab. houses at Watling-st., Motherwell, at £110,000.

Scotstoun West.—Plans prepared for workshops and storage buildings for Yarrow & Co., Ltd., for which the architects are C. J. McNair & Elder, 272, St. Vincent-st., Glasgow.

FUTURE CONSTRUCTION

CONTRACTS OPEN

For some contracts still open, but not included in this list, see previous issues. Those with an asterisk are advertised in this number. The dates at the heads of paragraphs are those for the submission of tenders; a dagger (†) denotes closing date for applications; the name and address at the end refer to the person from whom particulars may be obtained.

BUILDING

APRIL 29.

†***Bolton C.B.**—Alterations and additions at Bridgeman-st. Baths. B.E. and S. Tenders by May 28.

APRIL 30.

†**Crook and Willington U.D.C.**—50 houses at Nelson-st. C. Dep. £2 2s.

MAY 3.

Higham Ferrers T.C.—34 houses at High-st. estate, scheme 1. S. Dep. £2 2s.

Hornsea U.D.C.—84 houses, outbuildings, paths, drainage, etc., off Rowlston-rd. Blackmore and Sykes, Ruskin House, 141, Princes-ave., Hull. Dep. £2 2s.

Lyme Regis T.C.—12 houses at Rough Field site. Lucas, Roberts and Brown, architects and surveyors, Barnfield Hill, Exeter. Dep. £3 3s.

†**Penistone U.D.C.**—34 houses and street works at 2 sites. Lunn, Heppenstall and Lunn, Chartered Architects, 3, Station-rd., Milnbridge. Dep. £2 2s. Tenders by May 20.

MAY 4.

Mirfield U.D.C.—34 houses at Kitson Hill-rd. E. and S. Dep. £2 2s.

†**Ross and Cromarty C.C.**—20 houses at Muir-of-Ord County A.

Rugby R.D.C.—42 houses at 4 sites. D. G. McVinnie, M.I.M. & Cy.E., S. Dep. £2 2s.

†***Southgate B.C.**—Conversion of surface shelter to dressing accommodation for sports at Broomfield Park. B.E. and S. Dep. £2 2s.

MAY 6.

Acton T.C.—Construction of reinforced concrete floor for laundry at Public Baths. B.E.

Barrow-in-Furness C.B.—88 houses at Greengate-st., north site. B.E. and S.

Blackwell R.D.C.—10 houses at Hawthorne-ave., Tibshelf. Architect and Housing Superintendent, Dale-close, 100, Chesterfield-rd., South, Mansfield, Notts. Dep. £2 2s.

Burghead T.C.—22 houses at Hopeman-rd. J. and W. Wittet, Architects, 81, High-st., Elgin.

Dover T.C.—45 houses at Old Park Hill-corner, Buckland Valley, and Green-la. Farm estate. B.E. and S. Dep. £3 3s.

Huntingdon Standing Joint Committee.—8 police houses at 2 sites. T. H. Longstaff, County S. and A., Walden House, Huntingdon.

Rhayader R.D.C.—12 houses at Dark-la. S. N. Shrimpton and Son, Knighton, Radnor. Dep. £2 2s.

Solihull U.D.C.—(a) 62 houses at Cranmore Boulevard; (b) roads and sewers at Green-la.; (c) road surfacing, kerb laying and surfacing footpath, etc.; (d) surface water sewer at Damson-la. C. R. Hutchinson, E. and S. Dep. £5 contract (a), and £2 each for (b), (c) and (d).

***Southampton C.B.**—Extensions, alterations, adaptations and sundry repairs at Hampshire Girls' Orphanage, King's Park-rd., for conversion to health clinic. Borough A. Dep. £2 2s.

South Holland Drainage Trust.—6 new bridges over Little Holland drain. E. G. Tavener, E.

†***Whitchurch (Salop) U.D.C.**—52 houses at Egerton-rd., site in 3 groups. F. Clayton, C. Dep. £3 3s.

MAY 7.

Docking R.D.C.—66 houses at 4 sites. F. Ward, Housing Officer. Dep. £2 2s.

Ringwood and Fordingbridge R.D.C.—11 pairs houses at Parsonage Barn-la. site. Frank Andrews (L.), 45, High-st., Ringwood. Dep. £2 2s.

Woodbridge U.D.C.—12 houses and site works at Naunton-rd. C., Council Offices.

MAY 8.

†**Metropolitan Water Board.**—Houses at Valley-rd., Shortlands, Kent. S. to the Board (Room 176), New River Head, Rosebery-ave., E.C.1. Dep. £2 2s.

Northern Ireland Housing Trust.—420 houses and 100 flats with site works at Cregagh, Belfast. Ministry of Finance (Room 103), May-st., Belfast. Dep. £5.

Royston (Yorks) U.D.C.—30 houses at Pinfold-la. C. M. Pratt, C. Dep. £2 2s.

MAY 9.

Lichfield R.D.C.—168 houses at 3 sites. G. K. Pullen. C. Dep. £2 2s.

†***London County Council.**—(1) 116 dwellings and incidental works at Brooke House site, Hackney; (2) 52 dwellings and incidental works at Chicksand-st., Stepney; (3) 170 dwellings at Darling-row, Bethnal Green; (4) 88 dwellings at Dinmont estate, Bethnal Green; (5) 43 dwellings at Frankham-st., Deptford; (6) 99 dwellings at Harrow-st., St. Marylebone; (7) 38 dwellings at King and Queen-st., Southwark; (8) 43 dwellings at Morning-la., Hackney; (9) 60 dwellings at Pembury-rd., Hackney; (10) 96 dwellings and 5 shops at Shadwell-gdns., Stepney; (11) 361 dwellings at Tulse Hill, Lambeth; (12) 140 dwellings at White City, Hammersmith. Director of Housing and Valuer, The County Hall, Westminster Bridge, S.E.1.

Ludlow R.D.C.—56 houses at 4 sites. A. E. Wilson, F.I.Q.S., Clifton-bldgs., Old-st., Ludlow. Dep., £2 2s.

MAY 10.

Bathavon R.D.C.—75 dwellings at Batheaston. Grayson and Goldsmith, (F.), 7, Bridge-st., Bath. Dep. £2 2s.

Filey U.D.C.—56 houses at Newthorpe (extension) site. Eric Jordan, M.I.M. & Cy.E. S. Dep. £5 5s.

***Merton and Morden U.D.C.**—Repairs at Morden Hall, Morden Cottage and the Mill. E. Dep. £1 1s.

Walsall C.B.—12 police houses at 6 sites. B.S. Dep. £3 3s.

MAY 11.

Dolgelley U.D.C.—(a) 19 houses; (b) roads and sewers at Froheulog site, Arran-rd. C. Dep. £5.

East Kesteven R.D.C.—54 houses at 3 sites. Chartered Architect, Council Offices, Northgate, Sleaford.

†**Isle of Ely C.C.**—Extensions to County Library at Gordon-ave., March, together with alterations to existing premises. E. D. Robson (A.). County A., County Hall, March. Dep. £2 2s.

Prestwich T.C.—28 houses at Kersal-rd. B.E. and S. Dep. £2 2s.

PRICES OF MATERIALS.

Sheet lead and lead pipe advanced on April 1 to £6 5s. per ton.

Glazed bricks: Best quality white glazed stretchers are now £40 per 1,000.

St. Austell U.D.C.—24 houses at Penwithick Village. E. and S. Dep. £2 2s.

***Salop C.C.**—Conversion of "Glen View," Ludlow, into Nurses' Home. A. G. Chant, County A., 5, Belmont, Shrewsbury.

MAY 13.

†**Brentford and Chiswick T.C.**—Garage and repair shop at River Depot, Corney-rd. B.E. and S. Dep. £2 2s.

Great Torrington T.C.—13 pairs houses at 3 sites. Oliver and Son, Architects, Queen Anne's-chbrs., Barnstaple.

***Kettering T.C.**—36 houses in 2 groups. B.E. Dep. £2 2s.

Lydney R.D.C.—36 houses at various sites. H. Russell, E. and S. Dep. £2 2s.

Wallasey C.B.—21 blocks of houses at Pasturecres., Moreton. B.E. and S. Dep. £2 2s.

Walsingham R.D.C.—14 Swedish houses at Briston. Housing Officer, 10, The Square, Fakenham. Dep. £2 2s.

MAY 14.

Harpenden U.D.C.—50 houses at Batford estate. H. E. Stopher, M.Sc., A.M.Inst.C.E., E. and S. Dep. £2 2s.

Thedwastre R.D.C.—16 houses and service road at Elmswell. Hunt and Coates, Architects, 84, Guildhall-st., Bury St. Edmunds. Dep. £3 3s. Tenders by June 11.

Weardale R.D.C.—8 houses at 2 sites. J. J. Eltringham, Architect, Derwent-st., Blackhill. Dep. £3 3s.

MAY 15.

Keith T.C.—38 houses at Cuthill site. Burgh S. Dep. £1.

MAY 16.

***Hornsey T.C.**—34 cottages at Annington-rd., N.2. J. H. Melville Richards, B.E. and S. Dep. £2.

***Salop C.C.**—Canteen kitchen, dining room and laboratories at Coalbrookdale County High School. A. G. Chant, County A. Dep. £2 2s.

MAY 17.

†***West Sussex Standing Joint Committee.**—11 police houses at various sites. F. R. Steele (F.), F.S.I., County A. Dep. £2 2s. Tenders, June 7.

MAY 18.

Barnes T.C.—Construction of 4 blocks of temporary single-storied offices and caretaker's bungalow at Hampton-sq., Mortlake. W. R. Shepherd, A.M.Inst.C.E., B.E. and S. Dep. £2 2s.

MAY 20.

Nottingham T.C.—Construction of 4 million gallon reinforced concrete service reservoir and water tower at Kimberley. B. W. Davies, E. and General Manager. Dep. £5 5s.

WOOD BLOCK FLOORING

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MAY 21.

***Bath T.C.**—88 houses at Moorlands estate. City E. Dep. £2 2s.

Horsham U.D.C.—26 houses, Orchard- and McLeod-rds. C. G. Atkinson, F.S.I., Council Offices. Dep. £2 2s.

MAY 23.

Wilmslow U.D.C.—(a) Roads and sewers; (b) 114 houses in 5 groups. W. R. Willcox, C. Dep. £2 each for (a) and (b).

MAY 25.

St. Ives (Hunts) T.C.—50 houses at Ramsey-rd.-Houghton-rd. estate. T.C. Dep. £2 2s.

MAY 27.

***Manchester T.C.**—119 houses and cottage flats at Baguley Hall area, Wythenshawe, Contract No. 14. Housing Dept. Dep. £3 3s.

MAY 28.

***Southall T.C.**—100 houses at Dormers Wells (Part II) estate. B.E. Dep. £2 2s.

JUNE 4.

***Stepney B.C.**—300 flats and 133 houses at Limehouse Fields scheme, Contract No. 647. B. W. Stuttle (F.), M.Inst.M. & C.E., B.E. and S. Dep. £20.

NO DATE.

Ashbourne R.D.C.—52 houses at 5 sites. H. Litchfield, S. Dep. £2 2s.

MISCELLANEOUS

MAY 4.

Atherton U.D.C.—Demolition of semi-sunk shelters. S.

MAY 6.

Bridgend U.D.C.—Demobilisation of 30 surface shelters and 6 trench shelters. R. C. Bestow, S. Dep. £2 2s.

MAY 8.

Poole T.C.—Demolition of A.R.P. and N.F.S. structures. J. K. Barron, B.E. and S., Municipal-bldgs. Dep. £2 2s.

Redditch U.D.C.—Demolition of shelters. E. and S.

MAY 9.

Reigate T.C.—Demolition of concrete shelters and linked Anderson shelters. B.E. and S. Dep. £1 1s.

MAY 13.

Bournemouth C.B.—Demolition of static water basins. B.E. Dep. £1 1s.

Isle of Wight R.D.C.—Removal of defence works, etc. C.

MAY 14.

Swindon T.C.—Demolition of shelters, warden's posts, etc. B.S.

MAY 18.

Stafford T.C.—Demolition of shelters. B.E. Dep. £2 2s.

PAINTING, ELECTRIC LIGHTING, MATERIALS, ETC.

MAY 6.

Deal T.C.—B.E. and S.

MAY 7.

Epping U.D.C.—S.

MAY 8.

Gloucester T.C.—City S.

Wenlock T.C.—B.S.

MAY 9.

St. Neots R.D.C.—External painting of 86 houses. S. Dep. £1.

Wolverhampton C.B.—(1) External painting at Ward-st. clinic; (2) external and internal painting at Park-la. and Lea-rd. clinics. B.E. Dep. £1 1s.

MAY 10.

***Llandudno and District Hospital.**—Exterior and interior painting of hospital buildings. C. B. Pearson and Son, (F.), 18, Dalton-sq., Lancaster.

MAY 11.

Rayleigh U.D.C.—Internal redecoration at 60 houses and 6 bungalows. S.

MAY 13.

Camberwell T.C.—B.E. and S.

ROADS, SEWERAGE AND WATER WORKS

MAY 3.

Rowley Regis T.C.—Surface dressing. B.E. and S. Dep. £2 2s.

MAY 4.

Clevedon U.D.C.—Roads and sewers. E. and S. Dep. £2 2s.

Sleaford U.D.C.—Surface dressing. Acting S.

MAY 6.

Aylesbury T.C.—Construction of 1,114 lin. yds. of trunk sewer. B.E. and S. Dep. £2 2s.

Long Eaton U.D.C.—Roads and sewers at Welbeck-rd. H. Kaven, E. Dep. £5 5s.

North Cotswold R.D.C.—Extension of water supply at 3 parishes. Col. W. Herbert Bateman, M.Inst.C.E., Batheaston, Bath. Dep. £5.

Rhayader R.D.C.—Road and sewer at Dark-la. S. N. Shrimpton and Son, Knighton, Radnor. Dep. £2 2s

Rowford T.C.—Roads and sewers at Heaton-ave. B.E. and S. Dep. £3.

Rugeley U.D.C.—Widening and extending existing road and extension of sewer at Burnt-hill-la. E. and S. Dep. £2 2s.

Southampton T.C.—Laying and jointing of approx. 9 miles of cast-iron water main. Waterworks Office. Dep. £5.

Tiverton R.D.C.—Laying 3-in. water main extensions at 7 places. Water E.

MAY 7.

Newquay U.D.C.—Roads and sewers at Mount Wise estate. S. Dep. £3 3s.

Ringwood and Fordingbridge R.D.C.—Roads and sewers, Parsonage Barn-la. F. Andrews (L.), 45, High-st., Ringwood. Dep. £2 2s.

MAY 8.

Acton T.C.—Surface dressing.

Denton U.D.C.—Drainage and sewage pumping station. G. B. Kershaw and Kaufman, 1, Victoria-st., S.W.1. Dep. £5 5s.

Stockton-on-Tees T.C.—Roads and sewers at 2 sites. B.E. Dep. £3 3s.

Tynemouth C.B.—Construction of Red Burn sewer, Section 4. B.S. Dep. £2 2s.

MAY 10.

Rowley Regis T.C.—Site levelling at Brickhouse Farm estate. B.E. and S. Dep. £1 1s.

Surbiton T.C.—Surface dressing. B.E. and S.

MAY 11.

Crompton U.D.C.—Roads and sewers at Lower Rushcroft site. E. and S. Dep. £2.

Harrow U.D.C.—Roads at Rayners-la. S. Dep. £2 2s.

Rayleigh U.D.C.—Tarspraying, etc. S.

Withnell U.D.C.—Laying approx. 840 yds. 18 in. dia. and 104 yds. 24 in. dia. concrete pipes, 870 yds. kerb and channel, iron fencing, etc. S. Dep. £2 2s.

MAY 13.

Buxton T.C.—Sewerage works at Harpur Hill. B.S. Dep. £3 3s.

Leeds T.C.—Road construction at Cottingley Hall estate, City A. Dep. £2 2s.

MAY 14.

Huddersfield T.C.—Construction of reservoir and ancillary works at Valley of Rigley Brook. G. H. Hill and Sons (Manchester), Engineers, 51, Mosley-st., Manchester. Dep. £15 15s.

MAY 18.

Brierfield U.D.C.—Sewer at Mansfield estate. S. Dep. £2.

MAY 21.

***Oxford T.C.**—Foundations, drains, etc., for 170 Howard houses at Rose Hill No. 3 (B) site. E. and S.

MAY 23.

Halstead R.D.C.—Construction of 1¼ miles of stoneware and concrete pipe sewers. John Taylor and Sons, Artillery House, Artillery-row, Westminster, S.W.1. Dep. £5.

MAY 25.

Dunmow R.D.C.—Extension of Hatfield Heath sewage disposal works. J. D. and D. M. Watson, MM.Inst.C.E., 3, Old Queen-st., Westminster, S.W.1. Dep. £2 2s.

JUNE 1.

***Isle of Ely C.C.**—Concrete paving at Hereward School, March.

PUBLIC APPOINTMENTS

*Full details of Public Appointments marked * are advertised elsewhere in this issue. Those marked † have been advertised in previous issues.*

MAY 1.

***West Suffolk C.C.** — (a) Architectural Assistant; (b) Buildings Inspector.

MAY 4.

***Dagenham B.C.**—General Foreman.

***Portland U.D.C.**—Clerk of Works.

MAY 6.

***Brierley Hill U.D.C.**—Architectural Assistant.

***Deptford T.C.** — Second-class Engineering Assistant.

***Golborne U.D.C.**—Housing Manager (male).

†Corporation of London.—Grade I Inspector.

†Eastbourne C.B.—Quantity Surveyor.

Essex C.C.—Assistant Building Surveyor.

†London County Council.—Lecturers for full-time senior courses in (1) Architecture; (2) Surveying; (3) Structural Engineering.

***Oxford T.C.**—Architectural Assistant.

†Plymouth T.C.—Housing Estates Manager.

†Rushden U.D.C.—Clerk of Works.

†Salford T.C.—Assistant Building Surveyor.

†Salford T.C.—Quantity Surveyor.

†Stockton-on-Tees.—(1) Assistant Architect; (2) Clerk of Works; (3) Builder's Clerk.

MAY 7.

***Lowestoft T.C.**—Chief Building and Estates Assistant.

†Singapore Improvement Trust. — Office Assistant.

***Stretford T.C.**—Clerk of Works.

MAY 8.

†Government of Northern Ireland.—Architect in Ministry of Health and Local Government.

***Macclesfield T.C.**—Clerk of Works.

***Southgate B.C.** — Architectural Assistant (Temp.).

***Wallasey C.B.**—Deputy Borough Architect

MAY 9.

***Bexley T.C.**—(1) Assistant Architect; (2) Architectural Assistant.

***London County Council.**—Welfare Officer (building apprentices).

***Weston-super-Mare T.C.**—Deputy Highways and Cleansing Superintendent.

MAY 10.

Belfast E.C.—Head of Building Trades Dept., College of Technology.

†Herts C.C.—(a) Principal Assistant Architect; (b) Senior Quantity Surveyor; (c) 3 Assistant Quantity Surveyors; (d) 6 Building Surveyors.

***Hunts C.C.**—Chief Architectural Assistant.

***Marylebone B.C.**—(a) Housing Surveyor; (b) Building Licensing Officer.

***Solihull U.D.C.**—(a) Senior Architectural Assistant; (b) Architectural Assistant; (c) Architectural Assistant; (d) Senior Town Planning Assistant; (e) Engineering Assistant; (f) Engineering Assistant; (g) Building Inspector; (h) Clerk of Works; (i) Tracer Draughtsman (female).

MAY 11.

***Islington B.C.**—Inspector of Sewers, Drains and Buildings.

***Wilts C.C.**—Architectural Assistant.

***Wilts C.C.**—Building Inspector.

†Yeovil and District Joint Town Planning Committee.—Senior Town Planning Assistant.

MAY 13.

***Birmingham E.C.**—Assistant Master of Architecture.

***Lewes B.C.** — Temporary Engineering Assistant.

***Mansfield T.C.**—Assistant Building Inspector.

***Middlesbrough C.B.**—Assistant Architect.

***St. Pancras B.C.**—Architectural Assistants (Temp.).

MAY 15.

***Camberwell T.C.** — (a) 3 Engineering Assistants; (b) Mechanical Engineering Assistant; (c) Sewers Superintendent.

MAY 16.

***Leeds T.C.**—Planning Assistants.

MAY 17.

***Northampton E.C.**—Two Assistant Architects.

***Norwich City College and Art School.**—Full-time Teacher of Building Subjects.

***West Riding C.C.**—(1) Assistant County Architect (education group); (2) Assistant County Architect (planning and design); (3) 3 Senior Assistant Architects; (4) 8 Assistant Architects; (5) Senior Heating and Ventilating Engineer; (6) 2 Assistant Heating and Ventilating Engineers; (7) Structural Engineer; (8) Electrical Engineering Assistant; (9) Senior Surveyor (sites); (10) 2 Assistant Surveyors; (11) 2 Junior Surveyors (sites); (12) Principal Quantity Surveyor; (13) 2 Assistant Quantity Surveyors; (14) 2 Junior Assistant Quantity Surveyors.

MAY 18.

***Birmingham E.C.**—Assistant Teacher of Building Construction and associated subjects.

***Bridgwater T.C.**—Clerk of Works.

***Essex C.C.**—Building Surveyor (northern section).

***Essex C.C.**—Building Surveyor (eastern section).

***Essex C.C.**—Assistant Architects.

***Lewisham B.C.**—(1) Two Senior Architectural Assistants; (2) Two Architectural Assistants; (3) Surveying Assistant

MAY 20.

***Ealing T.C.**—Two Architectural Assistants.

†Ministry of Labour and National Service.—Assistant Managers (temp.) at Government Training Centre.

MAY 22.

***Cheshunt U.D.C.**—Clerk of Works.

MAY 23.

***Liverpool T.C.**—Deputy City Architect and Director of Housing.

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MAY 31.

***London County Council.**—Head of Department of Senior Building and Evening School.

JUNE 1.

***Shoreditch T.C.** — Chief Architectural Assistant.

JUNE 3.

†Northants C.C.—Deputy County Architect.

NO DATE.

***Bath T.C.**—(1) Senior School Building Surveyor; (2) Assistant School Buildings Surveyor.

***Staffs C.C.** — (1) Senior Architectural Assistants; (2) Junior Architectural Assistants; (3) Assistant Surveyor; (4) Specification Writer.

***Surrey C.C.**—Full-time Instructor of Brickwork.

GENERAL BUILDING WORK

Bedworth.—U.D.C. propose 450 houses at North Ward and 200 at East Ward and 250 at Bulkington.

Birkenhead.—T.C. to acquire sites for two County Colleges.—T.C. propose: residential hostel for aged.—Salvation Army Authorities propose Citadel at Well-la.

Chesterfield.—T.C. propose:—60 houses at Wash House-la., Chatsworth-rd.; library with Art Gallery and Museum at central site.

Coventry.—The Family Health Club Housing Society (Coventry), Ltd., propose 2,000 houses with social centre at Binley, at £2,000,000.

Crompton.—U.D.C to erect 66 houses at Duchess-st.

Fleetwood.—T.C. propose strengthening sea defences and widening of promenade, at £82,610.

Liverpool.—James Cottle, Ltd., 87, Lord-st., propose buildings off Long-la., Fazakerley.

Liverpool.—E.C. propose dining-room and kitchen at Holly Lodge High School.

Manchester.—T.C. approved:—Factory at Waterloo-rd., Hightown, for S. Glisher, Broughton, Atkinson, Eagle & Sons (L.), architects, 37, Brown-st.—Additions at Newton Heath, for Mather & Platt, Ltd.; alterations to offices at King-st., for London Assurance Co., Ltd., H. S. Fairhurst & Son (FF), architects, Chancery-chbrs., 55, Brown-st.

Mansfield.—T.C. approved works for disabled at Sutton-rd., for the Disabled Employment Corporation, Ltd.

Middleton.—T.C. propose shopping centre at Glebe estate, Rochdale-rd.

Newcastle (Staffs).—Swettenhams, Ltd., propose commercial garage at Sutton-st., Chesterton.

North Riding.—E.C. propose school canteen at Bewby Wiske and canteen kitchen at Brawby.

Oldham.—T.C. propose branch library at Limeside estate.

Rotherham.—E.C. propose nursery schools.

Salford.—T.C. approved:—Clothing factory at Great Clowes-st., Broughton, for W. W. Susman.

Stafford.—T.C. propose developing 41 acres of land at Coton Hill for 1,250 houses.

Stanley (Co. Durham).—U.D.C.'s five years' plan includes erection of 2,110 houses.

Stockport.—T.C. propose community centres off Gorton-rd., Reddish, and at Adswood-gr., Adswood.

Stockport.—T.C. approved:—Extensions to commercial garage and workshop for Central Garage, Gorton-rd., Reddish, for C. W. Hayes; extensions to offices, Howard-st. Mill, Portwood, for William Emery, Ltd.; additions to Bleach Works, Cheadle Old-rd., Cheadle Heath, for Sykes & Sons, Ltd.

Stockton-on-Tees.—W. & T. R. Milburn, 17, Fawcett-st., Sunderland, are architects for houses in flats at Crooks Barn-la., for Imperial Chemical Industries, Ltd.

Swinton and Pendlebury.—Lancs C.C. propose police houses at Beechfield estate.

Thornaby-on-Tees.—T.C. to erect 500 houses.

Wallasey.—T.C. approved extension of Catholic Church of the Sacred Heart, Upton-rd., Moreton, for Catholic Authorities. Engaged J. D. Harvey as Town Planning Consultant for Church-st. redevelopment scheme.

Whitehaven.—T.C. propose development of St. Ives Valley estate for 2,000 houses.

Wigan.—The Disabled Persons Employment Association, Ltd., propose factory for disabled at Wood-st.

Worcs.—E.C. propose junior and infants' schools at Rubery and infants' school at Sidemoor.

TENDERS

* Denotes *accepted.*
† Denotes *provisionally accepted.*
‡ Denotes *recommended for acceptance.*
§ Denotes *accepted subject to modification.*
¶ Denotes *accepted by H.M. Government departments.*

Bangor (North Wales).—5 houses at Caernarvon-rd., for T.C. C. Richard, City S.: *G. & J. P. Gregory, Ltd., 24, High-st., Caernarvon.

Billingham-on-Tees.—24 bungalows at Chatsworth-gdns.: *H. A. Dawson (Estates), Ltd., Billingham.

Bromsgrove.—Extensions at County High School, for Worcs. E.C. L. C. Lomas (F.), County A., 60, The Tything, Worcester: *Espley & Co., 77, High-st., Evesham, £1,132.

RICKER LIBRARY OF ARCHITECTURE

Cheshunt.—48 houses at Bury Green estate, for U.D.C.: *Hubert C. Leach, Waltham Cross. £56,960.

Co. Cavan.—Erection of factory at Erne Hill estate, for Irish Shoe Supplies (1946), Ltd., Belturbet: *James J. Smith, Carrickville, Upper Lavey, Co. Cavan, £32,000.

Dunston-on-Tyne.—Factory at Team Valley Trading Estate, for Leylands Motors, Ltd.: *Hadden & Hillman, 127, New Bridge-st., Newcastle.

East Suffolk.—(a) Erection of two M.O.W. huts with brick wall panels for kitchen and dining-room with small service room at Lowestoft Secondary School; (b) taking down existing playshed. E. J. Symcox (F.), County A., County Hall, Ipswich: *Comben & Wakeling, Ltd., Thoro'fare, Halesworth, Suffolk, £3,338.

Godstone.—Housing, drains, etc., for Smallfield scheme, for R.D.C.: *Jno. Crewdson, Horley, Surrey.

Huddersfield.—36 houses at Brackenhurst estate, for T.C. H. Nuttall (A.), Boro. A. and Town Planning Officer: *H. Mays (Builders), Ltd., Chapel-hill, Huddersfield.

King's Lynn.—9 pairs of houses at Kemperd. estate, for T.C. J. R. Courtney, F.F.A.S., Housing A.: *G. Collison & Sons, King's Lynn, £19,718.

Liverpool.—Works, for T.C. L. H. Keay (F.), City A. Exterior painting at Broad Green Hospital: *W. Morris & Bros., Ltd., 14, Colquitt-st., Liverpool, 1, £1,940; exterior painting at Olive Mount Children's Home: *W. Moss & Sons, Ltd., Roscoe-st., Liverpool, 1, £880.

London (Air Ministry).—List of contracts to value of £500 or over for week ended April 13:—General maintenance work: Cull Contractors, Belfast; J. Eakin & Co., Ltd., Londonderry; J. & R. W. Taggart, Belfast. Heating and hot water supply: Beaven & Sons, Ltd., London, S.W.1. Electrical work: East Anglican Elec. Supply Co., Ltd., Stowmarket, Suffolk. Painting work: Kilbourne's, Ltd., Manchester. Tarmac and asphalt surfacing work: Crowley Russell Co., Ltd., Glasgow, C.2.; Limmer & Trinidad Lake Asphalte Co., Ltd., London, S.W.1; Hadsphaltic Construction, Ltd., London, E.C.3; Constable Hart & Co., Ltd., London, S.W.1, Highways Construction Co., Ltd., London, S.W.1; Geo. Wimpey & Co., Ltd., London, W.6; Neuchatel Asphalte Co., Ltd., London, S.W.1; Chittenden & Simmons, Ltd., Maidstone, Kent; Anglo-American Asphalt Co., Ltd., London, W.C.2; Western Trinidad Lake Asphalt Co., Ltd., Cardiff.

Manchester.—Factory, 432-434, Oldham-rd., Miles Platting, for H. Margolis: *G. Margolis & Co., 44, Heywood-st., Cheetham, Manchester, 8; additions to offices at works, Cross-st., Bradford, for Mitchell Emery Wheel Co., Ltd.: *Fram Reinforced Concrete Co., Ltd., Plymouth-gr., Chorlton-upon-Medlock, Manchester, 13; additions to works at Harper-rd., Northenden, for V. H. Iddon, Ltd.; *Donald Macdonald, Ltd., Trafford Bar, Manchester, 16.

Northern Ireland Housing Trust.—293 houses at Lisburn. G. P. & R. H. Bell and E. F. Malcolmson, architects: *Wm. Logan & Sons, Ltd., Limestone-rd., Belfast.

South Shields.—Factory at Brunswick-st., for Lambs Products, Ltd.: * G. Thornton & Co., Porchester-st., South Shields.

Sunderland.—For extensions to bakery, for Prydes, Ltd., Coronation-st., Sunderland: *Jas. Huntley & Sons, Marion-st., Sunderland.

Swinton and Pendlebury.—64 houses at Ellesmere-st., site, for T.C. C. J. Prestwich & Sons (FF.), Bradshawgate-chbrs, Leigh: *Direct Labour Department, Swinton and Pendlebury Corporation, £75,378.

Thirsk.—74 houses and road works at Suttonrd., for R.D.C.: *Walter Thompson, Ltd., Northallerton, £71,430. (Subject to M.H. approval.)

Tipton.—62 houses at Denbigh estate, Horseley Heath, for T.C. H. N. Woodard, B.E. and S.: *Asphalte and Public Works, Ltd., Congreve-st., Birmingham, £73,997. (Subject to M.H. approval.)

Uxbridge.—30 houses and road and sewer works, for U.D.C.: *W. Turner (Builders), Ltd., 42, Upper Richmond-rd., East Sheen, London, S.W.14, £37,996.

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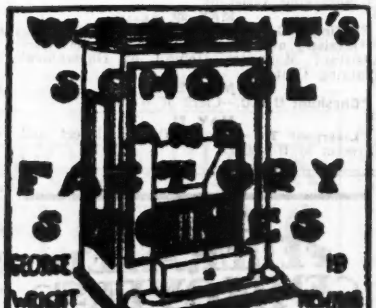

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